



Guidelines for WB3 Part I: Stakeholder Workshop 1

Identification of existing and
potential prevention and mitigation
strategies

Authors: Felicitas Bachmann, Gudrun Schwilch,
Ernst Gabathuler, Hanspeter Liniger

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(CDE), University of Bern, Switzerland***

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Foreword

The DESIRE WB3 methodology was developed by the Centre for Development and Environment (CDE). It is based on experiences from the 'Learning for sustainability (L4S)' methodology (http://www.cde.unibe.ch/Tools/ALS_Ts.asp) and the WOCAT methodology (www.wocat.net). It consists of three parts:

- Part I: Stakeholder Workshop 1: Identification of existing and potential prevention and mitigation strategies (WP 3.1)**
- Part II: Assessment of Conservation Strategies: Assessment and documentation of existing and potential prevention and mitigation strategies (WP 3.2)**
- Part III: Stakeholder Workshop 2: Selection and decision on prevention and mitigation strategies to be implemented (WP 3.3)**

These guidelines are a working instrument for use in conducting and moderating the DESIRE WB3 Stakeholder Workshop 1.

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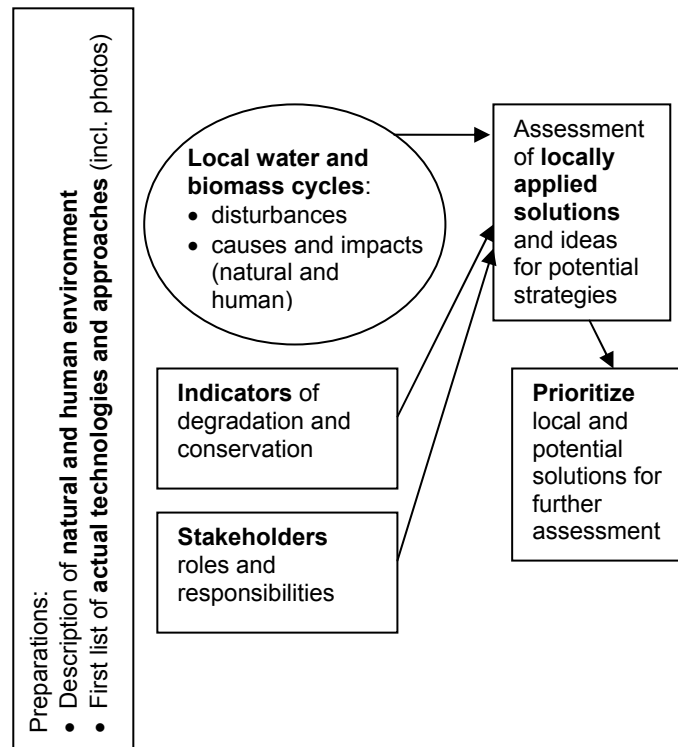
The graph on the following page illustrates the overall WB 3 methodology

WB3 Methodology

WP 3.1

Stakeholder workshop 1

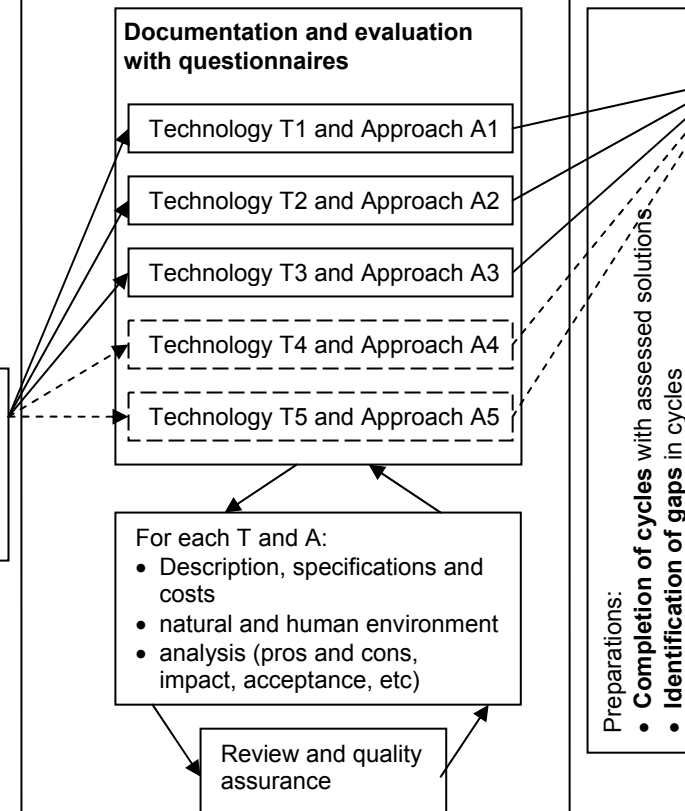
- Mutual learning
- Identification of actual and potential solutions
- 3-5 days



WP 3.2

Assessment of local and potential solutions

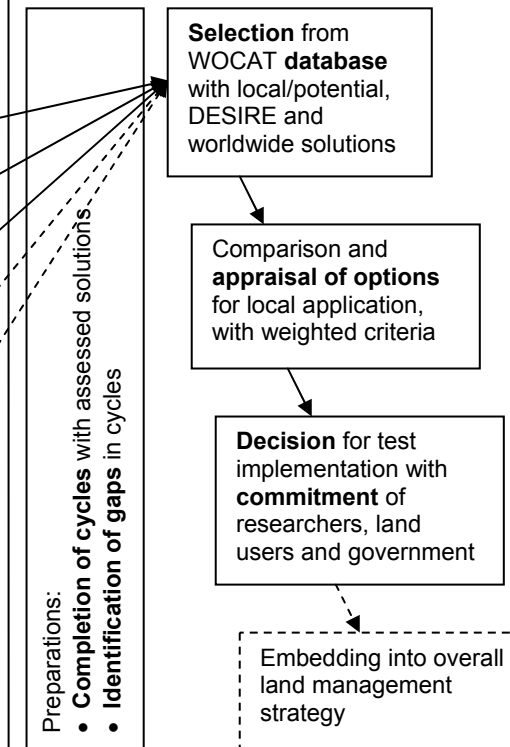
- Documentation and evaluation
- 2-3 months



WP 3.3

Stakeholder workshop 2

- Selection and decision support for local implementation
- 2-3 days



Guidelines for WB 3 Part I

Stakeholder Workshop 1: Identification of existing and potential prevention and mitigation strategies

Introduction

Land degradation and desertification – existing and potential prevention and mitigation strategies

In each of the 18 study sites of the DESIRE Programme a stakeholder workshop on 'Land degradation and desertification – existing and potential prevention and mitigation strategies' will be conducted. It has the following objectives and contents:

Overall aim:

To identify promising (existing and potential) strategies for land conservation for the selected study site.

Objectives:

1. To initiate a mutual learning process among local and external participants by sharing experience and jointly reflecting on current and potential problems and solutions regarding land degradation and desertification.
2. To create a common understanding of problems, potentials and opportunities by integrating external and internal perceptions. To foster a common understanding of problems and solutions related to land degradation and desertification.
3. To strengthen trust and collaboration among concerned stakeholders.
4. To identify existing and new strategies to prevent or mitigate land degradation and desertification.
5. To select a set of these identified strategies for further evaluation and documentation with the WOCAT methodology.

Contents of the workshop:

- Identification of land degradation and desertification processes, their causes and impacts.
- Identification of local indicators for land degradation.
- Identification of currently applied and of potential prevention and mitigation strategies (land conservation).
- Identification of stakeholders, and their roles and responsibilities concerning sustainable land management.
- Working step by step towards an outline of a coherent overall strategy for land conservation in the given local context.

The workshop sequence is designed in such a way that the understanding of land degradation and conservation processes increases step by step (i.e. exercise by exercise), and elements for an outline of an overall strategy for land conservation evolve. The sequence can be described as:

1. Fact finding: to be aware of local problems and local solutions
2. To arrange information (to put in order): to become aware of causes and impacts
3. To plan for the future: to develop a strategy including potential new solutions

A connecting methodological element throughout the module is the use of photos that illustrate land degradation and land conservation issues. Therefore a digital camera and a colour printer are needed for the workshop.

Introduction to the workshop guidelines

To whom the guidelines are addressed	The present guidelines are a working instrument for use in moderating DESIRE WB3 stakeholder workshops. They are designed to support the study site moderators in guiding the processes of mutual reflection and exchange by workshop participants. At the same time they are a baseline document to be used in the training of moderators.
Content of the guidelines	<p>The workshop guidelines consist of:</p> <ul style="list-style-type: none"> a) didactic guidelines, which formulate learning objectives, address group dynamics, and offer ideas for the introduction of sequences; b) topical notes, which provide the moderator with theoretical and conceptual orientation on specific topics; and c) a selection of exercises to cover the different topics.
How should the guidelines be used?	<p>The guidelines are intended as a flexible working instrument. The moderator may work with the suggested exercises, adapt them, or develop new ones, if required.</p> <p>The workshop programme needs to be continually adapted to the process. In principle, all topics, including interactions and linkages between them, should be considered. However, the moderator may change the order of topics and determine their relative importance. But, he / she is bound to respect the principles and the spirit of the learning process (in a didactic sense; see below).</p>
Target groups	<p>The stakeholder workshop addresses the following target groups:</p> <ul style="list-style-type: none"> a) local stakeholders (land users, representatives of local authorities, local NGOs etc.) who live in the specific rural environment (<i>local participants</i>); and b) external stakeholders, i.e. researchers and development professionals (from NGOs, GOs etc.) working in rural environments (<i>external participants</i>), with different degrees of professional expertise on environmental and development issues. This means, the group is composed of researchers, project staff and representatives of the local community (land users, local authorities). All members of the group have experience in and knowledge about the specific rural environment.
Duration of a workshop	<p>The duration of a stakeholder workshop is at least 3 days. During the 1st and 2nd day the focus is on local perspectives and the local context; mainly local stakeholders attend the meetings. On the 3rd day, external stakeholders join the group, and bring in their perspectives and experience especially emphasizing the broader context, i.e. with a focus on the regional level and regional and national framework conditions.</p> <p>However, if external stakeholders are willing to participate throughout the three days invite them to do so! This allows a more intense exchange and fosters understanding, but take care that the focus is kept on local perspectives and that external participants don't dominate the process.</p>

Location

The workshop is carried out in a village / community, i.e. in a specific local context. Participants stay **in the village/community** for the duration of the workshop. Close contact between local and external workshop participants foster mutual trust and facilitate a joint learning process.

Experience shows that it is much easier to create a relaxed and trustful working atmosphere if the workshop takes place in the community itself, where local participants feel at home. **Try to avoid very formal meeting places** such as rooms from the local administration or classrooms with unmovable furniture, as people usually feel less at ease and the atmosphere tends to be tense. Collaborative learning requires a flexible environment, where people can sit together and talk instead of classroom teaching arrangements. Working directly in the field (e.g. transect walk) usually opens up the minds of everybody, and makes local people feel that the discussions really touch on their reality and their concerns!



An example of a **not ideal** because too formal room! Fixed and heavy furniture hamper flexible working arrangements for group work, and create unnecessary distance between participants.



An example of a **suitable** meeting room with movable furniture.

Planning and organisation of a workshop

Requirements for workshop moderators

Generally two persons of the DESIRE programme will be present during the stakeholder workshop:

- **Person A:** is the **moderator of the stakeholder workshop** and responsible for structuring and guiding the process. He /she has to be familiar with moderation techniques and participatory methods.
- **Person B:** **assists** the moderator during the stakeholder workshop in documenting the work and results, and in preparing the workshop report. Person B has expert knowledge on Soil and Water Conservation (SWC) / Sustainable Land Management (SLM), and **will later document and evaluate the land conservation strategies** with the help of the WOCAT questionnaire together with local stakeholders (within WP 3.2).

Requirements for moderators of Stakeholder Workshops (Person A)

Moderators should fulfil the following:

- Good knowledge of the area / community where the workshop will be conducted: they should be familiar with local conditions (socio-cultural, bio-physical, land use, land degradation and conservation, etc.).
- Be familiar with soil and water conservation issues (no expert knowledge required!).
- Skills in moderation and participatory methods.
- Trustful relationship with involved stakeholder groups
- Communication skills; speak the local language of the study site.
- Didactical skills
- Conflict management skills

Requirements for SWC expert who documents and evaluates land conservation strategies (Person B)

- Understanding of the local context (biophysical, social and economic)
- Specific knowledge in soil and water conservation / sustainable land management / desertification mitigation
- Skills in extension work (advises in soil and water conservation)
- Skills in documentation / illustration of strategies, redaction of case studies
- Trustful relationship with land users

Responsibilities and task in the organization and preparation of a workshop

Organization: The stakeholder workshop is organized by the study site leader in collaboration with the workshop moderators.

Responsibilities and tasks:

- The **study site leader** bears the main responsibility for the selection of a village, negotiations with local authorities, and logistical arrangements (accommodation, meals, transport, etc).
- The **moderator** is primarily responsible for collecting background information on the local context, organizing material needed for the workshop (e.g. paper, markers, pin board, camera, transport facilities, etc.).
Of primordial importance is a serious and in-depth preparation of the topics and contents of the workshop, i.e.:
 - get familiar with the guidelines and exercises;
 - be aware of the objectives of the stakeholder workshop and expected outcomes;
 - prepare short introductions to the different topics / exercises;
 - make necessary adaptations to the exercises to fit to the local context;
 - think on how to relate the results and outcomes of one exercise with others.

Selection of the village/community

The following criteria should be observed in selecting a village or community in which to carry out a workshop:

- In the study site; land degradation and land conservation being current issues
- Interest and willingness to participate
- Sufficient capacity to accommodate participants during the workshop

Inform the village / community	<p>The study site leader and / or the moderator visit the village prior to the workshop in order to inform about the workshop process and its objectives, to initiate the process of selecting local participants, and to clarify organisational aspects. This may be done in a village meeting, the aims of which could be:</p> <ul style="list-style-type: none"> • presentation of participants and their roles; • presentation of workshop programme and objectives; clarify expectations; • to thank the villagers for their hospitality and participation.
Poster exhibition	<p>A poster exhibition on the DESIRE programme has been elaborated as an additional approach to inform the population in the study sites on the programme, its objectives, partners, study sites, the stakeholder process etc.</p> <p>It is suggested that the exhibition is shown in the study site before the stakeholder workshop to inform the population and also to motivate them to participate in a workshop.</p>
Composition of the group	<p>The following criteria should guide the selection of workshop participants:</p> <ul style="list-style-type: none"> - The group is composed of around 6 to 10 local stakeholders (land users, local authorities, representatives of local NGOs), and 4 to 6 external stakeholders (researchers, representatives of regional NGOs and GOs), and (1 or) 2 moderators. - Ensure that the group is heterogeneous with regard to age, gender, ethnicity and activities related to land use. The group should also be interdisciplinary in composition.
Selection of participants	<ul style="list-style-type: none"> - General: it is recommended to select participants (local and external) who are interested in collaborating in the DESIRE program, which means not only to participate in a workshop but also to be a partner in the selection and implementation of conservation measures. - local participants (land users): According to the study site, different types / categories of land users / farmers may be found: e.g. large-scale / small-scale farming; farmers mainly producing for auto-consumption / for the market; differences in land tenure (land ownership and use rights); wealth, etc. It is recommended that representatives of the main categories of land users found in the study site are among the local participants as these differences may influence the choice of possible solutions concerning soil and water conservation (e.g. no trees allowed on leased land); i.e. for different categories of land users different conservation technologies or approaches might be appropriate.
Time and duration of the workshop	<p>The time for carrying out a workshop is determined primarily by the availability of the participants, particularly land users, which means considering the agricultural calendar!</p> <p>The duration of the workshop is at least 3 days. If possible, it is advisable to extend to 4 days, as the schedule will not be so tight and workshop days less charged.</p>
Invitation and preparation of the group	<p>The moderator issues timely invitations to interested professionals and researchers, providing information about the content and objectives, time and programme of the workshop, and conditions for participants. Local participants will also receive this information from the moderator or local institutions that help in organising the workshop.</p>
Organisation of accommodations in the village	<p>The following arrangements need to be made (by the study site coordinator) with regard to accommodating the group in the village:</p> <ul style="list-style-type: none"> - lodging: lodging facilities must be found and appropriately readied for external participants. Ensure that the distance to the workshop venue is not too big. - meals: residents of the village will be employed to do the cooking, so that all participants can devote themselves to the workshop. Common meals including everyone (researchers, professionals and local participants) are a central aspect of mutual experience and also promote informal contacts. It is necessary to clarify whether a sufficient local supply of food is available, or whether supplies have to be brought from outside.

Overview on the Programme of Stakeholder Workshop 1

Preparations for Stakeholder Workshop 1 (to be made by the moderators):

- Collect information on the natural and human environment of the study site 1 day
- First inventory (list and photos!) of locally applied technologies and approaches 1 day
- Methodological preparations 1–3 days
- Preparation of the workshop venue 0.5 day



WP 3.1: Stakeholder Workshop 1: programme overview

Day 1		Minutes
Introduction to the workshop		60
Exercise 1: Picture gallery		
• Participants present themselves		70
• Establishing a personal relation to the workshop topic		
Exercise 2: The water and biomass cycles: Disturbances and solutions		10
• Step 1: The cycles		60
• Step 2: Transect walk		120
Daily evaluation		20
		Total 5h 40'
Day 2		
Exercise 2: (continuation):		
• Step 3: Illustration of the cycles		70
• Step 4: Institutional, legal and socio-economic aspects that influence land management		30
• Step 5: Diagnosis of the cycles (socio-economic aspects; disturbances and available solutions)		45
Exercise 3: Local indicators for land degradation and land conservation		35
Exercise 4: Stakeholders – their influence on and motivation to implement sustainable land use		90
Exercise 5: Recapitulation of intermediate workshop results		60
Daily evaluation		20
		Total 5h 50'
Day 3		
Exercise 6: Presentation of intermediate results to external participants		90
• Introduction new participants		
• Presentation of intermediate results		
Exercise 7: Assessment of already applied and potential solutions to identified problems of land degradation		180
Exercise 8: Synthesis: Outline of a strategy for sustainable land management		75
Exercise 9: Evaluation of the workshop		30
Closure of the workshop		10
		Total 6h 25'



Next Steps in WB 3:

WP 3.2: Detailed documentation and assessment of local and potential solutions (2-3 months)

WP 3.3: Stakeholder Workshop 2: Selection and decision support for local implementation(2-3 days)

Evaluation of the workshop

- Daily evaluation** A brief evaluation at the end of each workshop day serves to get a reading on the mood of the group, and to identify and introduce corrective measures as needed. Possible methods are: “**mood barometer**” (a rating scale on which each person expresses his opinion by marking a particular point), or a **round** in which all participants can **briefly** express themselves.
Possible guiding questions: What did you like most? What did you not like?
- Principles to be observed: free, individual expression; tolerance of the opinions of others; respect. Do not discuss what has been stated unless something severe needs to be clarified.
- Final evaluation** The objectives of the final evaluation are: to get a feedback from participants on contents/achieved results, process/didactics, and organisation/logistics.
- Possible methods: Immediate, freely expressed, or written reactions to the workshop (organisation, procedure, didactic approach, content, etc.). It might be helpful to formulate a few specific questions to be answered by participants (for suggestions see Exercise 9).

Reporting

- Workshop report** The moderators and the research team of the study site share the responsibility for documenting the workshop results and writing a workshop report. They agree among themselves who is going to document which part.
- Please note, that the results of the 1st stakeholder workshop, in particular the results of Exercise 4. ‘Stakeholders, their interest and influence in sustainable land management’; and Exercise 8: ‘Synthesis: elements for an overall strategy’ will provide an important starting point for stakeholder workshop 2. Therefore a good documentation of these results is important!
- Please keep all the documents from the stakeholder workshop 1** (e.g. the big sheets with the cycles, etc.), as you will need them again for stakeholder workshop 2!
- Language:*
1. A detailed workshop report has to be written in the **local language**.
 2. A summary report has to be written in **English** and submitted to WB3. **A format for the English summary report is provided in Annex 1!**

<i>Expected outcomes</i>	<i>From exercise</i>	<i>For WB</i>
Identification of land degradation / desertification processes and solutions	1 / 2	1
Identification of trends and tendencies in land degradation / desertification and land conservation	2	1
Identification of drivers, causalities and effects of land degradation / desertification and land conservation practices by local stakeholders	2	1 / 2
List of stakeholders, their roles and responsibilities in land management	4	1
Selected local indicators for land degradation / desertification and land conservation formulated by local stakeholders	3	2
Brief assessment of 2-3 locally already applied solutions	7	3
Brief assessment of selected new opportunities and potentials recognized by the learning group	7	3
Inputs to an overall strategy towards SLM that fits the local context	8	3

A few words on the didactic approach and the intended spirit of the stakeholder workshop

Didactic approach	<p>The workshop methodology and approach aims to bring about a learning process at the level of the group and of the individual. Learning occurs through a process of joint reflection, during which everyone actively confronts his or her own reality as well as other people's realities. This implies learning from one another.</p> <p>Active learning means that one is involved in the learning process with head, hand and heart. Thus, learning is not just a cognitive process as emotions and experience are systematically also called upon. This allows individual, interpersonal and thematic aspects to be interconnected, and fosters a holistic form of learning.</p>
To learn with and from each other	<p>Each participant, whether local stakeholder or external professional or researcher, brings his specific knowledge, perception, and experience into the learning process. The learning occurs at the interface of different perspectives, through a process of dialogue and joint reflection. Respect, mutual trust, and open-mindedness are attitudes that foster active mutual learning. In this sense each participants is a learner and a teacher at the same time.</p>
Working atmosphere	<p>Learning thrives on mutual exchange and a spirit of community. Establishing a climate of mutual trust within the learning group is therefore of prime importance.</p> <p>It is important to allow space for getting to know one another, for informal mutual exchange, and to create a friendly atmosphere.</p>
The role of the moderator	<p>The moderator is a facilitator of the mutual learning process. His / her main tasks are:</p> <ul style="list-style-type: none">• To create a relaxed and productive working atmosphere;• To ensure the temporal and spatial organisation of the group's work;• To foster an appreciative, respecting and accepting atmosphere within the group;• To moderate the dialogue between participants;• To restrain himself / herself from putting his own opinion and position in the foreground! <p>What to avoid in the role of the moderator?</p> <ul style="list-style-type: none">... lecturing, teaching;... dominating the process;... judging the contributions of participants;... emphasizing his own opinions and ideas concerning the thematic issues of the workshop.
Setting up the group	<p>In the beginning, particular attention has to be given to the group process as conflictive relations can obstruct the learning process. When starting, a group may be more or less hampered by insecurity and fear. Fear can be reduced by offering the participants appropriate structures to get to know and interact with each other. Rules of communication that create an atmosphere of acceptance and give enough space to everyone need to be agreed upon.</p>
Attitude	<p>Living learning depends on the participants' inner presence. An atmosphere of acceptance allows the participants to deal creatively with difficult situations that may evolve. The moderator can decisively influence the emergence and maintenance of this atmosphere. His / her attitude and openness will set the standard!</p>
Disturbances have precedence	<p>A disturbance is anything that prevents participants from focusing on the common theme: absentmindedness, irritation, boredom, conflicts, etc. Living learning requires that all participants can concentrate on theme and group process. Disturbances always have an effect: they even bind energies when they are ignored! Usually, theme and process are positively stimulated if disturbances are taken into account.</p>

Preparatory work

Preparatory work of the moderator(s) prior to the workshop	(3 – 5 days required)
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The moderator(s) need to be prepared for facilitating the stakeholder workshop. Besides organisational preparations it is important that the moderator(s) take enough time to get well familiar with the workshop guidelines, with the local context, and to think about how they are going to address the topical issues of the workshop. Prior to the workshop, 3 to 5 days have to be spent by the moderator(s) to make the following preparations.

1. Collect information on the study site, read and fill in chapter 2.7 (natural environment) and 2.8 (human environment) of the WOCAT Questionnaire on Technologies (QT) (1 day)

Fill in the two chapters for the area of the study site (not for a specific technology, as will be the case when evaluating a technology). → See extract of questionnaire QT in *Thematic Sheet 'Environment'*. This allows you to gather information on the study site in order to get a picture of the context in which the workshop will take place: agro-ecological conditions, socio-economic / socio-cultural aspects, particular site-specific features, possible areas of conflict, etc. It may be done in discussions with resource persons (eg representatives of local authorities, NGOs etc.), and/or during a field visit.

In each study site certain bio-physical or socio-economic factors (e.g. land tenure, law of succession, etc.) may strongly constrain the implementation of specific soil and water conservation technologies and approaches.

Objectives:

- It is necessary that the moderator is aware of such factors as they have to be considered in the selection and assessment of potential solutions!
- This background information will facilitate your task as a moderator!
- The documentation and evaluation of the identified technologies and approaches in WP 3.2 will be easier

2. Make an inventory and take photos of current soil and water conservation strategies in the study site (1 day)

Prepare a brief inventory (list of technologies) of already applied soil and water conservation measures in the study site. Document with photos from the study site! Do not only focus on 'spectacular' measures such as check dams, bunds, reforestation etc. but also think of the sometimes less obvious but equally important land use practices to maintain e.g. soil fertility and humidity by measures such as the use of cow dung, leaving crop residues on the field (mulching), etc. Please differentiate between technologies applied on cropland and those applied on grazing or forest land!

Objectives:

- In the workshop the inventory may serve as a 'prompter' during the process of identification of already applied solutions. Experience shows that local stakeholders often are not aware of solutions they already apply because they are just part of their current land use practices.
- The photos of locally applied solutions will be used during the workshop in exercise 1 and 2. Make color prints on format A5 paper.

3. Methodological preparations for the workshop (1 – 3 days)

Read the workshop guidelines very carefully, and try to imagine each exercise step by step. Think about how each exercise is related to the objectives of the workshop, about the expected results of an exercise, and the conclusions that might be drawn from each exercise. Think about material that might help you to introduce a sequence, or to explain or illustrate specific aspects of a topic or an exercise.

- Prepare any useful material that might support the moderation process (documents, maps, photos, camera, etc.). → see also checklist below
- Develop ideas and write down key words on how you are going to introduce the different topics and exercises. Think about how you can translate theoretical concepts into the words and metaphors of local land users. Use examples and pictures they are familiar with and that are relevant to their life and environment.
- Identify procedures for linking topics and creating transitions from one topic to the next.
- Think about which steps or exercises can be merged if necessary (eg. in case of time constraints!). A coherent procedure needs to be ensured in this respect. Don't lose sight of the overall aim of the stakeholder workshop!
- Adapt exercises to the specific conditions of your study site where necessary.

Objectives:

- To get familiar with the guidelines, the exercises and their objectives.
- To be prepared to use the guidelines as a flexible instrument, as adaptations (in time and topics) might be necessary in the course of the workshop.
- To be able to speak in words and metaphors local people understand.

4. Preparation of the workshop venue and working materials (0.5 day)

Make the necessary preparations in the workshop venue (either the evening before the workshop starts or in the morning).

- Make sure that the venue is tidy.
- Check if enough chairs and tables are available. Arrange the furniture in such a way that the group can sit together and that there is enough place for laying out the photos (Exercise 1).
- Make sure that abundant working material is available such as paper sheets (format A1, format A4, colored paper, etc.), tape, markers, scissors, glue, thumbtacks, blackboard, chalk, etc.
- Check electricity
- Install a laptop (and beamer if necessary); install a color printer; organise 2 digital cameras.
- Etc.

Objectives:

- To be ready when the workshop starts.
- To be able to concentrate on the topic and process, instead of having to deal with organisational and logistic questions.

Thematic sheet

Environment

→ for workshop preparations

Natural and Human Environment of the study site

2.7 Natural environment

Give details of the natural (bio-physical) conditions of your study site.

- ☐ **Circles always require ranking!** It is possible to give more than one option the same rank.
 Use only ranks 1, 2 or 3 (1 = very important / large extent; 2 = important / medium extent; 3 = less important / little extent)
 Make use of the specify/remark/comments column or line as much as possible!

	Rank according to areal extent (max. 2 circles per question)	Comments
2.7.1 Average annual rainfall		Indicate average annual rainfall and seasonality (eg monsoon, winter- / summer rains)/ length of dry periods if known.
< 250 mm	<input type="radio"/>
250-500 mm	<input type="radio"/>
500-750 mm	<input type="radio"/>
750-1000 mm	<input type="radio"/>
1000-1500 mm	<input type="radio"/>
1500-2000 mm	<input type="radio"/>
2000-3000 mm	<input type="radio"/>
3000-4000 mm	<input type="radio"/>
4000-5000 mm	<input type="radio"/>
> 5000 mm	<input type="radio"/>
2.7.2 Agro-climatic zone		
humid	<input type="radio"/>
subhumid	<input type="radio"/>
semi-arid	<input type="radio"/>
arid	<input type="radio"/>

Agro-climatic zone

- **Humid:** length of growing period (LGP) > 270 days
- **Subhumid:** LGP 180 – 269 days
- **Semi-arid:** LGP 75 – 179 days
- **Arid:** LGP 0 – 74 days

The length of growing period (LGP) is defined as the period when precipitation > 0.5 PET (potential evapotranspiration) and the temperature > 6.5° C.

2.7.3 Thermal climate classification		
tropics	<input type="radio"/>
subtropics	<input type="radio"/>
temperate	<input type="radio"/>
boreal	<input type="radio"/>
polar/arctic	<input type="radio"/>

Thermal climate classes (all temperatures indicated as monthly mean temperatures corrected to sea level)

- **Tropics:** All months above 18° C
- **Subtropics:** One or more than one month below 18° C but above 5° C
- **Temperate:** At least 1 month with monthly mean temperatures below 5° C and 4 or more months above 10° C
- **Boreal:** At least one month below 5° C and more than one but below four months above 10° C
- **Polar / arctic:** All months below 10° C Source (FAO 2000)

	<i>Rank according to areal extent (max. 2 circles per question)</i>	Comments
2.7.4 Altitudinal zonation		
0-100 m a.s.l.	<input type="radio"/>
100-500 m a.s.l.	<input type="radio"/>
500-1000 m a.s.l.	<input type="radio"/>
1000-1500 m a.s.l.	<input type="radio"/>
1500-2000 m a.s.l.	<input type="radio"/>
2000-2500 m a.s.l.	<input type="radio"/>
2500-3000 m a.s.l.	<input type="radio"/>
3000-3500 m a.s.l.	<input type="radio"/>
3500-4000 m a.s.l.	<input type="radio"/>
> 4000 m a.s.l.	<input type="radio"/>
2.7.5 Landforms		
plateau / plains	<input type="radio"/>
ridges	<input type="radio"/>
mountain slopes	<input type="radio"/>
hill slopes	<input type="radio"/>
footslopes	<input type="radio"/>
valley floors	<input type="radio"/>

Landforms (modified after ISRIC 1993):

- **Plateau / plains:** extended level land (slopes less than 8 %).
- **Ridges:** narrow elongated area rising above the surrounding area, often hilltops or mountain-tops.
- **Mountain slopes** (including major escarpments): extended area with altitude differences of more than 600 m per 2 km and slopes greater than 15 %.
- **Hill slopes** (including valley and minor escarpment slopes): altitude difference of less than 600 m per 2 km and slopes greater than 8 %.
- **Footslopes:** zone bordering steeper mountain / hill slopes on one side and valley floors / plains / plateaus on the other side.
- **Valley floors:** elongated strips of level land (less than 8 % slope), flanked by sloping or steep land on both sides.

2.7.6 Slopes on average

flat	(0-2 %)	<input type="radio"/>
gentle	(2-5%)	<input type="radio"/>
moderate	(5-8%)	<input type="radio"/>
rolling	(8-16%)	<input type="radio"/>
hilly	(16-30%)	<input type="radio"/>
steep	(30-60%)	<input type="radio"/>
very steep	(>60%)	<input type="radio"/>

Slope gradient conversion table:

Slope in percent	Slope in degrees
2 %	1 °
5 %	3 °
8 %	5 °
16 %	9 °
30 %	17 °
60 %	31 °
100 %	45 °

2.7.7 Soil depth on average

very shallow	(0-20 cm)	<input type="radio"/>
shallow	(20-50 cm)	<input type="radio"/>
moderately deep	(50-80 cm)	<input type="radio"/>
deep	(80-120 cm)	<input type="radio"/>
very deep	(>120 cm)	<input type="radio"/>

2.7.8 Soil fertility

very high	<input type="radio"/>
high	<input type="radio"/>
medium	<input type="radio"/>
low	<input type="radio"/>
very low	<input type="radio"/>

2.7.9 Topsoil organic matter

high (>3%)	<input type="radio"/>
medium (1-3%)	<input type="radio"/>
low (<1%)	<input type="radio"/>

2.7.10 Soil drainage / infiltration		
good	<input type="radio"/>
medium	<input type="radio"/>
poor (eg sealing /crusting)	<input type="radio"/>
2.7.11 Soil water storage capacity		
very high	<input type="radio"/>
high	<input type="radio"/>
medium	<input type="radio"/>
low	<input type="radio"/>
very low	<input type="radio"/>
2.7.12 Ground water table (estimated depth to water)		describe seasonal fluctuations
on surface	<input type="radio"/>
< 5 m	<input type="radio"/>
5 – 50 m	<input type="radio"/>
> 50 m	<input type="radio"/>
2.7.13 Availability of surface water		describe seasonal fluctuations
excess (eg flood)	<input type="radio"/>
good	<input type="radio"/>
medium	<input type="radio"/>
poor / none	<input type="radio"/>
2.7.14 Water quality (untreated)		describe seasonality and source (ground-/ surface water)
good drinking water	<input type="radio"/>
poor drinking water	<input type="radio"/>
for agricultural use only	<input type="radio"/>
unusable	<input type="radio"/>
2.7.15 Biodiversity (species richness)		specify
high	<input type="radio"/>
medium	<input type="radio"/>
low	<input type="radio"/>

2.7.16 Number of growing seasons per year1 ☐ 2 ☐ 3 ☐

growing period: length in days (approximately) from which month to which month:

longest

2nd longest

Number of growing seasons per year: A growing season is a period of time where there is sufficient rainfall and moisture in the soil as well as high enough temperatures to grow a crop. A growing season can have several crops following each other.

2.8 Human environment and land use

Provide data for the land users of your study site!

2.8.1 Characteristics of the land users in the study siteIndividual/household ☐ groups / community ☐ cooperation ☐ individual companies ☐ government ☐Small ☐ medium ☐ large scale land users ☐Mainly women ☐ mainly men ☐ mixed ☐Leaders / privileged ☐ common / average land users ☐ marginalized land users ☐**2.8.2 Population density**< 10 persons/km² ☐ 100-200 persons/km² ☐10-50 persons/km² ☐ 200-500 persons/km² ☐50-100 persons/km² ☐ > 500 persons/km² ☐**2.8.3 Annual population growth (incl. migration)**negative ☐ specify %< 0.5 % ☐0.5 % -1 % ☐1 % -2 % ☐2 % -3 % ☐3 % -4 % ☐> 4 % ☐ specify %**2.8.4 Who owns the land and what are the land and water use rights?**

rank according to areal extent (max. 2 circles per question)

Land ownershipstate ☐company ☐communal / village ☐group ☐individual, not titled ☐individual, titled ☐other (specify): ☐**Rights:****Land use rights****Water use rights***open access (unorganised) ☐communal (organised) ☐leased ☐individual ☐other (specify): ☐

Comments:

.....

Land ownership is the type of land possession, while **land use rights** refer to the access to land.

Land use rights / water use rights:

- *Open access: means free for all.*
- *Communal (organised): means subject to community-agreed management rules.*
- *Leased: right to use land for a limited period of time against payment (contract).*
- *Individual: right of use by single user.*

* if water use rights are relevant

2.8.5 Level of wealth:

	What % of the land users in the region fall into the following categories?	What % of the total land area does each category own?
very rich%%
rich%%
average%%
poor%%
very poor%%
	100%	100%

Wealth: For classification in your area please use local instead of international standards.

2.8.6 How significant is off-farm income for the land users in your study area?

less than 10% of all income ☐ 10-50% ☐ > 50% ☐

Specify:.....

Off-farm income: income other than from the use of cropland, grazing land, forest and mixed land (eg business, trade, manufacturing, industry).

2.8.7 Access to services and infrastructure:

	low	moderate	high
health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
education	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
technical assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
employment (eg off-farm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
roads & transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
drinking water and sanitation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
financial services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
other (specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Definitions of land use types

Land use type

Cropland: Land used for cultivation of crops (field crops, orchards).

Grazing land: Land used for animal production

Forests / woodlands: land used mainly for wood production, other forest products, recreation, protection.

Mixed: mixture of land use types within the same land unit.

Other:

Subcategory

- **Annual cropping:** land under temporary / annual crops usually harvested within one, maximally within two years (eg maize, paddy rice, wheat, vegetables, fodder crops)
- **Perennial (non-woody) cropping:** land under permanent (not woody) crops that may be harvested after 2 or more years, or only part of the plants are harvested (eg sugar cane, banana, sisal, pineapple)
- **Tree and shrub cropping:** permanent woody plants with crops harvested more than once after planting and usually lasting for more than 5 years (eg orchards / fruit trees, coffee, tea, grapevines, oil palm, cacao, coconut, fodder trees)
- **Extensive grazing land:** grazing on natural or semi-natural grasslands, grasslands with trees / shrubs (savannah vegetation) or open woodlands for livestock and wildlife
- **Intensive grazing/ fodder production:** improved or planted pastures for grazing/ production of fodder (for cutting and carrying: hay, leguminous species, silage etc) not including fodder crops such as maize, cereals. These are classified as annual crops (see above)
- **Natural:** forests composed of indigenous trees, not planted by man
- **Plantations, afforestations:** forest stands established by planting or/and seeding in the process of afforestation or reforestation
- **Other:** eg selective cutting of natural forests and incorporating planted species
- **Agroforestry:** cropland and trees
- **Agro-pastoralism:** cropland and grazing land (including seasonal change between crops and livestock)
- **Agro-silvopastoralism:** cropland, grazing land and trees (including seasonal change between crops and livestock)
- **Silvo-pastoralism:** forest and grazing land
- **Other:** other mixed land
- **Mines and extractive industries**
- **Settlements, infrastructure networks:** roads, railways, pipe lines, power lines
- **Waterways, drainage lines**
- **Other:** wastelands, deserts, glaciers, swamps, recreation areas, etc

2.8.8 Cropland and cropland mixed with another land use type

If there is no cropland (incl. mixed land) in your study site, go to question 2.8.9.

2.8.8.1 Market orientation of production system

		comments
subsistence (self-supply)	<input type="radio"/>
mixed (subsistence + commercial)	<input type="radio"/>
commercial / market	<input type="radio"/>
other:	<input type="radio"/>
other:	<input type="radio"/>

Is production subsidised? no ☐ yes, little ☐ yes, moderately ☐ yes, highly ☐

Subsidy: a subsidy is an instrument used by the state or by private actors to reduce the costs of a product or increase the returns from a particular activity (Kerr, 1994). It may be provided in cash or in kind and usually serves a specific purpose.

2.8.8.2 How is land cultivation performed?

		comments
manual labour	<input type="radio"/>
animal traction	<input type="radio"/>
mechanised	<input type="radio"/>

2.8.8.3 Type of cropping system and major crops

		major cash crop	major food crop	other
annual cropping	<input type="radio"/>
perennial (non-woody) cropping	<input type="radio"/>
tree/shrub cropping	<input type="radio"/>
mixed (different land use types on same land unit, eg agroforestry, agropastoralism)				
specify:.....	<input type="radio"/>
specify:.....	<input type="radio"/>
Other, specify:.....				

For definitions see page 23

Water supply:

rainfed ☐ post-flooding ☐ mixed rainfed - irrigated ☐ full irrigation ☐

Rainfed: crop(s) establishment and development is completely determined by rainfall.

Post-flooding: after rainwater has naturally flooded the field (eg in Wadis, river banks), the water infiltrated into the soil is used intentionally as a water reserve for crop cultivation. The crop(s) use(s) this water reserve for establishment.

Mixed rainfed – irrigated: the application of a limited amount of water to the crop when rainfall fails to provide sufficient water for plant growth, to increase and stabilise yield; the additional water alone is inadequate for crop production.

Full irrigation: any of several means of an artificial regular supply of water, in addition to rain, to the crop(s).

Livestock:

Is livestock temporally grazing on crop residues: no ☐ yes little ☐ yes ☐

If considered important also fill in section 2.8.9 (mixed system)

2.8.8.4 Size of cropland per household

		comments
< 0.5 ha	<input type="radio"/>	
0.5-1 ha	<input type="radio"/>
1-2 ha	<input type="radio"/>
2-5 ha	<input type="radio"/>
5-15 ha	<input type="radio"/>
15-50 ha	<input type="radio"/>
50-100 ha	<input type="radio"/>
100-500 ha	<input type="radio"/>
500-1,000 ha	<input type="radio"/>
1,000-10,000 ha	<input type="radio"/>
>10,000ha	<input type="radio"/>

2.8.9 Grazing land and grazing land mixed with another land use type

If there is no grazing land (including mixed land) in your study site, go to question 2.8.10. For definitions of land use types see page 7

2.8.9.1 Market orientation of production system

		comments
subsistence (self-supply)	<input type="radio"/>
mixed (subsistence and commercial)	<input type="radio"/>
commercial / market	<input type="radio"/>
other:	<input type="radio"/>
other:	<input type="radio"/>

Is production subsidised? no ☐ yes, little ☐ yes, moderately ☐ yes, highly ☐

Subsidy: a subsidy is an instrument used by the state or by private actors to reduce the costs of a product or increase the returns from a particular activity (Kerr, 1994). It may be provided in cash or in kind and usually serves a specific purpose.

2.8.9.2 Type of grazing system

		main livestock* species / secondary livestock species
extensive grazing land:		
- nomadism	<input type="radio"/>
- semi-nomadism / pastoralism	<input type="radio"/>
- ranching	<input type="radio"/>
intensive grazing land	<input type="radio"/>
- cut-and-carry/zero grazing		
- improved pasture		
mixed (eg agro-pastoralism, silvo-pastoralism)		
specify:.....	<input type="radio"/>
specify:.....	<input type="radio"/>

* if wildlife is major part of the grazing system list species

Comments:

Extensive grazing land: grazing on natural or semi-natural grasslands, grasslands with trees / shrubs (savannah vegetation) or open woodlands for livestock and wildlife.

- **Nomadism:** people move with animals.
- **Semi-nomadism / pastoralism:** animal owners have a permanent place of residence where supplementary cultivation is practiced. Herds are moved to distant grazing grounds.
- **Ranching:** grazing within well-defined boundaries, movements cover smaller distances and management inputs are higher compared to semi-nomadism.

Intensive grazing land: grass production on improved or planted pastures, including cutting for fodder material (for livestock production).

- **Cut-and-carry/zero grazing:** Carrying fodder to animals confined to a stall / shed or another restricted area; in zero grazing systems the livestock are not permitted to graze at any time
- **Improved pasture:** pasture that is sown with a mixture of introduced grasses and legumes (can be fertilized and/or inoculated with rhizobia to fix nitrogen). (<http://www.environment.gov.au/soe/2001/land/glossary.html>)
- Definitions for mixed land: see page QT7

Water supply:

rainfed ☐ post-flooding ☐ mixed rainfed - irrigated ☐ full irrigation ☐

Definition see above 2.8.8.3

2.8.9.3 Livestock density

< 1 LU/km ²	<input type="checkbox"/>	25-50 LU /km ²	<input type="checkbox"/>
1-10 LU /km ²	<input type="checkbox"/>	50-100 LU /km ²	<input type="checkbox"/>
10-25 LU /km ²	<input type="checkbox"/>	> 100 LU /km ²	<input type="checkbox"/>

Livestock unit (LU) is a standardized animal unit obtained by multiplying total number of animals with a conversion factor that takes into account 'feed requirements' per animal.

2.8.9.4 Size of grazing land per household

		comments
< 0.5 ha		
0.5-1 ha	<input type="radio"/>
1-2 ha	<input type="radio"/>
2-5 ha	<input type="radio"/>
5-15 ha	<input type="radio"/>
15-50 ha	<input type="radio"/>
50-100 ha	<input type="radio"/>
100-500 ha	<input type="radio"/>
500-1,000 ha	<input type="radio"/>
1,000-10,000 ha	<input type="radio"/>
>10,000ha	<input type="radio"/>

2.8.10 Forest / woodland

If there is no forest / woodland in your study site, go to question 2.8.11; For definitions of land use types see page 7
Agroforestry systems are treated under the previous cropland or grazing land sections.

2.8.10.1 Market orientation of production system

		comments
subsistence (self-supply)	<input type="radio"/>
mixed (subsistence and commercial)	<input type="radio"/>
commercial / market	<input type="radio"/>
other (specify)	<input type="radio"/>
other (specify)	<input type="radio"/>

Is production subsidised? no ☐ yes, little ☐ yes, moderately ☐ yes, highly ☐

Subsidy: a subsidy is an instrument used by the state or by private actors to reduce the costs of a product or increase the returns from a particular activity (Kerr, 1994). It may be provided in cash or in kind and usually serves a specific purpose.

2.8.10.2 Type of forest / woodland uses

		problems / comments (eg cutting frequency)
selective felling of (semi-) natural forests	<input type="radio"/>
clear felling of (semi-)natural forests	<input type="radio"/>
plantation forestry	<input type="radio"/>
shifting cultivation	<input type="radio"/>
other (specify)	<input type="radio"/>
other (specify)	<input type="radio"/>

2.8.10.3 For what purpose do land users use forests and woodlands?

timber	<input type="radio"/>
fuelwood	<input type="radio"/>
fruits and nuts	<input type="radio"/>
grazing / browsing	<input type="radio"/>
other forest products / uses (honey, medical, etc.)	<input type="radio"/>
nature conservation / protection	<input type="radio"/>
recreation / tourism	<input type="radio"/>
protection against natural hazards	<input type="radio"/>
other (specify)	<input type="radio"/>

2.8.10.4 Size of forest / woodland area per household

		comments
< 0.5 ha		
0.5-1 ha	<input type="radio"/>
1-2 ha	<input type="radio"/>
2-5 ha	<input type="radio"/>
5-15 ha	<input type="radio"/>
15-50 ha	<input type="radio"/>
50-100 ha	<input type="radio"/>
100-500 ha	<input type="radio"/>
500-1,000 ha	<input type="radio"/>
1,000-10,000 ha	<input type="radio"/>
> 10,000ha	<input type="radio"/>

2.8.11 Other land**2.8.11.1 What are the types of other land and what are their major management constraints?**

	specify	major constraints
mines and extractive industries	<input type="radio"/>
settlement / urban	<input type="radio"/>
infrastructure network (roads, railways, pipe lines, power lines)	<input type="radio"/>
wastelands / deserts / glaciers / swamps	<input type="radio"/>
recreation	<input type="radio"/>
other (specify):		
.....	<input type="radio"/>
.....	<input type="radio"/>

Exercises

Introduction to the workshop

- Objectives**
- To inform the participants briefly on the DESIRE program
 - To inform participants on the objectives and programme of the workshop.
 - To know expectations of participants.
 - To prepare the ground for a good working atmosphere

Duration		Minutes
	1. Welcome participants	10
	2. Introduction to DESIRE program	10
	3. Objectives and programme of the stakeholder workshop	20
	4. Expectations from participants	10
	5. Rules of the game and intended working spirit	10
	Total	60

- Preparations and material required**
- Brief presentation on the DESIRE program (eg. PowerPoint, poster exhibition).
 - Workshop programme (written on sheets A1)
 - Paper sheets, markers, tape

Methodology Plenary session

- Procedure**
1. The moderator welcomes participants. Introduce yourself and let briefly everybody introduce his / her name (a more detailed presentation will be done in Exercise 1).
 2. Make a brief presentation of the DESIRE program and its objectives. Explain the role of the stakeholder workshop within the whole programme. Point out the importance of the participation in the workshop and thank participants for their interest.
 3. Present the workshop programme and the objectives. At the beginning of the workshop give an overview of the workshop programme. This makes it possible to deflate false expectations, and to give a sense of direction. Explain that the first two days will focus on the local perspective, and that on the third day external stakeholders will join the group and add with their experience and knowledge to complement the picture created so far.
 4. People come to a workshop with certain expectations. Ask participants about their expectations concerning the workshop / or the DESIRE programme. It is important to know them, to take them into consideration where possible and to clarify where they can not be accomplished.
 5. For a good working atmosphere, it is necessary to define and respect certain 'rules of the game' / rules of conduct. Take some time to discuss on: rights and duties of the participants; didactic principles of the workshop and roles of the participants; rules to be observed (eg. rules of communication, commitment to attend, etc).

- Expected results**
- The participants are clear about objectives, the procedure and programme of the workshop.
 - Agreed upon 'rules of the game'

Exercise 1: Picture gallery: Land degradation and land conservation issues

- Objectives**
- To smoothly start the workshop by establishing a personal relation with the workshop topic.
 - To give everybody an opportunity to present himself and his interest in the topic.
 - To establish a relaxed working atmosphere

Duration

	Minutes
1. Introduction	5
2. Individual selection of photos (1 st round)	10
3. Plenary session: presentation	20
4. Individual selection of photos (2 nd round)	10
5. Plenary session: presentation	20
6. Summary by the moderator	5
Total	70

- Preparations and material required**
- 40 to 50 photos showing aspects of land degradation. If possible use photos from the study site and complement with photos from other areas with similar problems.
 - 40 to 50 photos that illustrate possible solutions or sustainable land management practices. If possible use photos from the study site and complement with photos from other areas with similar problems.
 - A possible source for photos (from different geographical contexts) to complete your selection of photos from the study site is the WOCAT image database (→ see <http://www.fao.org/ag/agl/agll/wocat/wctimage.asp>)
 - Print the photos (format A5 to A4). **The photos have to be self-explanatory and 'easy to read' for the land users!**
 - Display the photos in the room (e.g. on a wall, on a table or on the floor), on one side those that illustrate land degradation / unsustainable land management, on the other side those that illustrate land conservation / sustainable land management.

Methodology Method: Photo language

Plenary session explain the procedure

Individually: 1st round: everybody selects 1 photo showing degradation; 2nd round: select 1 photo showing conservation aspects

Plenary session: everybody displays the photos he / she selected and explains why he / she selected them

- Procedure**
- 1. Plenary session:** The moderator explains the exercise. Invite the participants to visit the photo gallery, to watch the photos and to spontaneously select one photo that attracts his / her attention.
 - 2. 1st round: land degradation**
 Ask participants to select and keep 1 photo that attracts them. As a basis for the choice, ask a specific question: eg. 'Choose a photo that illustrates a situation that menaces your production'.
 Ask participants to think about what attracts their attention and why they have selected the respective photos. How can they relate the photo to their own reality and experience?
 When everybody has made his choice, ask people to come together. If possible, the group sits in a semi-circle. One after the other shows the photo he / she selected to the whole group, briefly introduces himself / herself and explains the reason for his / her choice.

3. 2nd round: land degradation

Ask participants to have a look at the land conservation photos and to select again 1 photo that attracts them. Reasons for being attracted may be:

- perceives something to be a potential solution to his / her problems
- curiosity

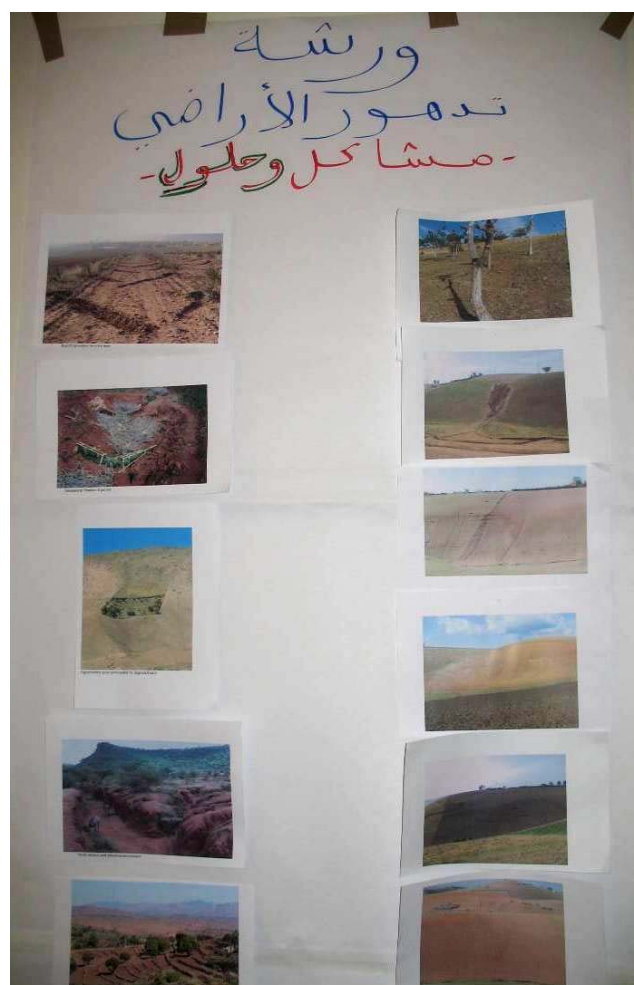
After everybody has made his choice the group meets and everybody displays the picture he / she selected and gives a brief explanation why he / she was attracted by the photo.

4. Summary by the moderator: The moderator summarises briefly the main reasons that have been mentioned and makes a link to the work of the next three days, i.e. to step by step outline an overall strategy of land conservation / sustainable land management by analysing impact chains (causes and effects) of land degradation; identifying indicators for land degradation processes and for sustainable land management; identifying already applied and potential new solutions; looking at stakeholders and their roles, etc.

5. In a break, paste the selected photos for problems and solutions on a big sheet of paper and stick it to the wall as a result of the exercise.

Expected results

- Information on degradation / desertification processes in space and time as perceived by local stakeholders.
- Information on land conservation practices in space and time as perceived by local stakeholders.



Problems (right) and solutions (left) as selected by the participants in Morocco.

Exercise 2: The water and biomass cycles: the basis for agricultural production

- Objectives**
- Understand land degradation processes and their dynamics (space and time) in the local context.
 - To understand links and relations between the water and biomass cycles.
 - Identify disturbances of the cycles, understand their causes and effects.
 - Identify already applied solutions to disturbances and land degradation.

Duration

	Minutes
Introduction to Exercise 2	10
Step 1: The water and the biomass cycles	60
Step 2: Transect walk	120
Step 3: Illustrate the cycles with photos from the study site	70
Step 4: Legal, institutional, and socioeconomic aspects	30
Step 5: Synthesis: diagnosis of the two cycles	45
Total	340

Comment

Exercise 2 is quite a 'heavy' but important exercise, which has to be divided into different sub-steps. Its objective is to understand causes and effects as well as the dynamics of land degradation processes in the study site. At the same time, already applied conservation practices (solutions) and 'entry points' for changes towards a more sustainable land management shall be identified.

This will be done by the means of a transect walk in the study site, where problems and solutions to disturbances in the cycles are discussed and documented by photos. But beforehand, the notion of the water and biomass cycles has to be introduced to the participants.

Water and biomass cycles

In the workshop, the cycles mainly serve as a framework to explain and illustrate processes of land degradation, their causes and effects, and to identify entry points and solutions for land conservation. **The main goal is to identify for which of the causes of soil degradation solutions are already locally available, and for which there are no or insufficient solutions. It is not the purpose of the exercise that participants acquire a very detailed or scientific understanding of the cycles!**

The exercise is sub-divided into the following steps:

Step 1: Introduce the notion of the biomass and water cycles, elaborate the basic elements of the cycle and its disturbances

Step 2: Transect walk: identify, discuss and document disturbances in the cycles, signs, causes and effects of land degradation, and locally applied solutions (to disturbances and land degradation)

Step 3: Illustrate the cycles with photos from the study site

Step 4: Socio-economic aspects of disturbances and land degradation

Step 5: Diagnosis of the cycles

Please find more detailed descriptions of the single steps below.

- Preparations and material required**
- Think about how to introduce the notion of cycles and their meaning. The moderator must find ways to translate the abstract concept of the cycles into words and images the land users understand!
 - Identify a transect route leading through areas where land degradation and land conservation issues are perceivable and representative for the study site.
 - Identify possible resource persons (knowledgeable, elderly people) to accompany the group and provide information on the past and present state of soils, land use practices etc.
 - Map (ca. 1:5'000) of the study site (→ *may probably be found on Google Earth, or check with the research team of your study site*)
 - If necessary (big distances), organize transport
 - Digital cameras (2 or more)
 - Colour printer
 - Paper sheets, format A 1
 - Markers (different colours)

- Methodology**
- Plenary session:** introduction to the cycles
- Group work:** transect walk, document land degradation processes and solutions
- Group work:** Illustrate the cycles with photos (disturbances, causes, effects, solutions)
- Plenary session:** presentation and discussion of group work
- Plenary session:** socio-economic factors leading to disturbances in cycles
- Plenary session:** Diagnosis of the cycles; disturbances that already have local solutions and such without, discussion and conclusions

Step 1: Biomass and water cycles – good yields require a good management of water and biomass cycles

Duration

	Minutes
1. Introduction: the cycle - a basic principle in nature and life	10
2. The basic elements of the water and the biomass cycle, and possible disturbances	30
3. Discussion and conclusions	20
Total	60

Preparations and material required

- Prepare the elements of the water and biomass cycles. Print or write them (basic elements in one colour, disturbances in another colour) in big enough letters on coloured paper sheets. As a reference use the graphs in the didactic support material.
- Cut arrows from coloured paper sheets to link the basic elements.

To be kept in mind!

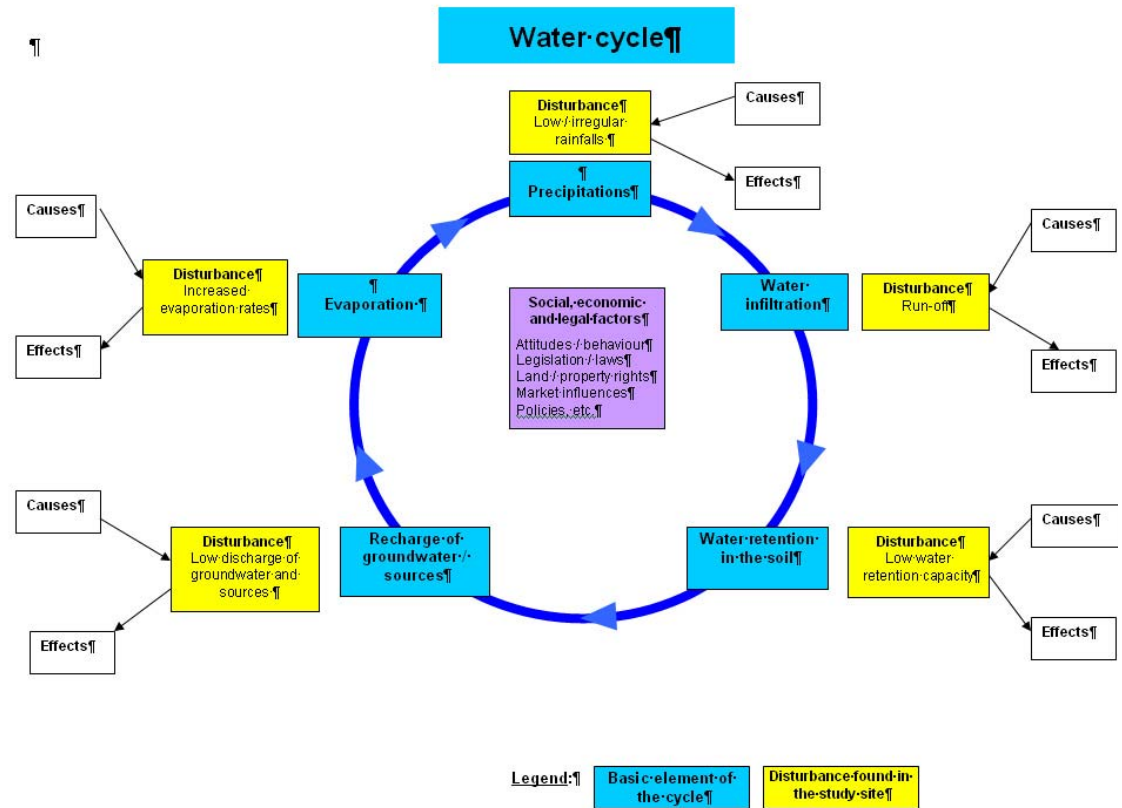
- A) Land degradation *per se* is usually not what interests or worries the farmers / local land users the most.** In their perspective it is water, yields, and returns! Therefore it is important to take **decreasing yields / economic returns, and the lack of water as a starting point** for discussion. From there you can easily investigate on causes and effects of land degradation.
- B) It is essential to make participants understand that the water and biomass cycles are linked with each other, and they both are means for agricultural and livestock production! Therefore, undisturbed water and biomass cycles are essential for production and a condition for the sustainability of resource management.**
- C) Do not only focus on problems and disturbances! Emphasise the future, as well as potentials and opportunities!**

Procedure

1. **Plenary session:** Introduce the notion of cycles. A possibility is to refer to cycles that directly influence our lives such as the circle of the year (seasons); life cycle etc. Ask the participants what types of cycle they know. What happens if there are disturbances in a cycle? Beware that the moderator has to translate the abstract concept 'cycle' to metaphors and words the land users understand!
2. **Plenary session:** Introduce and develop the **water cycle** and the **biomass cycle** on big sheets (stick together several A1 sheets).
 → *Models of a water cycle and a biomass cycle are supplied in the didactic support material. They may help you as a reference, although they are not to be used as a blueprint, and have to be adapted to the specific conditions and problems of the respective study site!*
 - Start with one of the two cycles. Develop its **basic elements / steps** (= blue boxes, see figure below). In the water cycle, start with 'precipitations', continue with 'water infiltration', etc. Explain each of the elements in an easy language, so that participants understand.
 - Identify and explain **disturbances** in the cycle (= yellow boxes, see figure below). For each basic element identify disturbances known in the study site.
 - Point to possible **causes** and **effects** of the disturbances of the cycle, give examples that are relevant for your study site to sensitise participants. Sometimes it is difficult to know whether something is a cause or an effect, because causes and effects are again interlinked in circles.

Procedure

- After finishing the first, explain the second cycle. Causes and effects of disturbances will be identified later, i.e. during the transect walk.

Example:**Example: Biomass cycle**

3. Plenary discussion:

The discussion serves as a preparation for the transect walk, as participants get sensitised to the links between the cycles, and to disturbances, their causes and effects.

Focus the discussion on the following questions:

- **What is the basis of a good production / good yields?**
Water and soil fertility. Therefore it is important to use water more efficiently (water conservation), and to maintain or improve soil fertility. Point to the importance of undisturbed cycles for agricultural production (yields, returns!). Water and biomass cycles are the basis for production and have to be maintained undisturbed.
- **How are the cycles linked together?** The cycles are linked. If both cycles are in good condition (undisturbed) they optimally work together and good yields are the result.
Example of how the cycles are linked: soil humidity depends on the management of biomass: the water retention capacity of a soil depends on its content of organic matter (biomass).
- **What are the consequences of disturbances in the cycles?**
Disturbances result in: lack of water, decreasing soil fertility, decreasing productivity, soil erosion and salinization, low yields, poverty, etc.
- **What are the impacts of conservation practices in the cycles?**
Sustainable land management practices result in improved soil cover, improved infiltration, enhanced water availability for plants, increased soil fertility, increased yields, etc.

Conclusions

- A good (sustainable) management of the water and biomass (→ soil fertility) cycles is a precondition for good yields.
- Current land management practices, as well as socio-economic aspects may have a negative influence on the cycles which result in disturbances of the cycles. Disturbances negatively influence the yields and returns from agriculture.
- Disturbances in one cycle can affect the other cycle.
- Land management practices that foster an efficient use of available water and the maintenance or increase of soil fertility are very important.

Step 2: Transect walk: identify disturbances and local solutions

- Objectives**
- To observe, discuss, and document disturbances in the water and biomass cycles occurring in the study site
 - To observe, discuss, and document locally applied solutions to deficits in the cycles such as preventive measures, soil and water conservation practices, etc.

Duration	Minutes
1. Introduction and organization of group work	10
2. Group work: transect walk	110
Total	120

- Preparations and material required**
- Define transect route
 - Note pads
 - 2 digital cameras
 - Colour printer

Introduction Except from the moderators, (most) participants at this stage of the workshop are local participants. This is an opportunity to 'investigate' the local perspective on land degradation and land conservation issues and how they are related to socio-cultural, economic, institutional and ecological factors of the local context. Therefore give priority to what local participants themselves identify as relevant and let them discuss and illustrate (photos) these issues. The moderators accompany one group each. They (and other external people that might be with the group) may enrich the discussion with their observations and questions.

- Procedure**
- 1. Assign tasks for the transect walk:** Explain the route of the transect walk. Split up in **2 groups**, one will relate its observations and discussions to the **water cycle**, the other to the **biomass cycle**. Each group observes, identifies and documents (photos): disturbances; causes/ effects; and very important: already applied solutions (soil and water conservation).
In each group:
 - 1 or 2 persons record relevant information concerning land degradation / land conservation. Take also notes on photos made, so that the group can later relate photos to issues discussed!
 - 1 person takes photos to illustrate important aspects concerning land degradation / land conservation issues (disturbances, causes, effects and already applied solutions). The group decides what photos shall be taken!



2. Transect walk:

Each group walks along the predefined transect route. **Observe, discuss, and document (photos) where and why which disturbances in the water and biomass cycle occur, and very important: what solutions are already being applied locally** (e.g. preventive measures, measures to maintain and increase soil fertility, biomass or soil moisture, current strategies for a sustainable land management, etc.).

A) Observations should cover the following aspects:

- land degradation / disturbances in the cycles: signs (indicators), causes and impacts/effects (biophysical, socioeconomic) of disturbances or degradation processes
(Comment: → indicators for land degradation / land conservation will also be covered in a separate exercise following the transect. However, the transect walk provides an excellent opportunity to touch on this topic and relate to observations made in the field.)
- changes in productivity, fertility, water availability, vegetation cover, etc.
- sustainable land management practices, locally applied solutions
- conflicts over resources (e.g. water, pastures, etc.)
- any other relevant issue

B) Photos: Each group takes photos to illustrate land degradation processes (disturbances in the cycles, causes, effects) as well as land conservation practices (locally applied solutions, preventive measures) related to the respective cycle it is focused on.

→ Take photos of local problems and local solutions!

- ## 3. Print photos:
- After the transect walk the groups get back to the workshop venue. **Download and print the photos** as you will need them tomorrow morning!

Right: Locally applied solutions



Below: Local problems...



Step 3: Illustrate the cycles with photos from the study site

- Objectives**
- Relate the concept of the water and biomass cycles to the reality of land degradation / land conservation processes in the study site
 - Visualise disturbances in the cycles and their effects.
 - Sensitise for and visualise solutions already applied in the local context.

Duration

	Minutes
1. Introduction and organization of group work	5
2. Group work: illustrate the cycles	50
3. Plenary session: presentation of cycles	15
Total	70

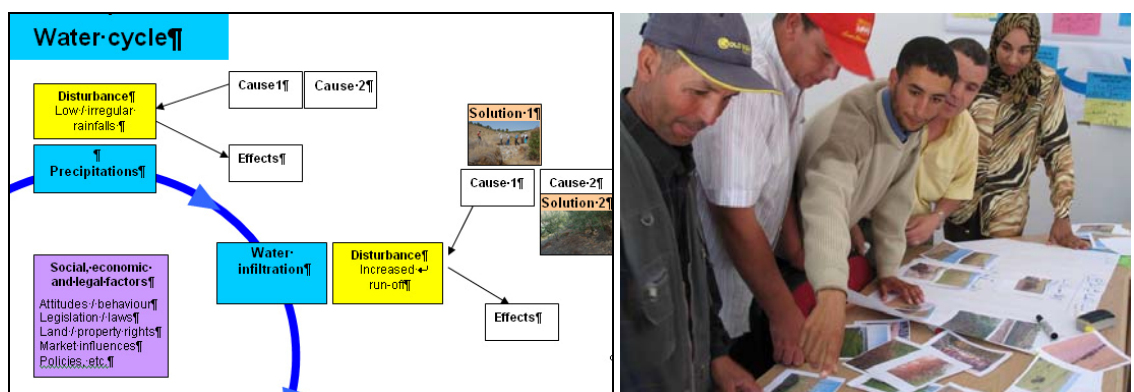
Preparations and material required **Preparation:** *If possible, schedule step 3 for the beginning of a new day in order to have enough time to sort and print the photos taken during the transect walk.*

Material required: photos (colour print, A5), big sheets of paper, cards (A5), scissors, glue, tape, markers

- Procedure**
- 1. Group work: Illustration of cycles**
Each group illustrates its cycle by using the notes and photos taken during the transect walk. You may also use additional photos if available (→ photos taken by the moderator during the workshop preparations 'inventory of locally applied solutions').

Illustrate disturbances, their causes and effects, and locally applied solutions.
For issues where no photos are available use cards (write down the issue)!

Example: part of the water cycle illustrated with solutions



Above: Graph → add causes, effects, solutions.

Photo: The working group selects relevant photos.

2. Plenary session: each group presents its cycle.



Step 4: Legal, institutional, and socio-economic aspects that influence the management of cycles

- Objectives**
- To identify socio-economic, legal and institutional aspects which foster or hamper sustainable land management in the study site

Duration		Minutes
	1. Plenary discussion on socio-economic, legal and institutional aspects that foster or hamper sustainable land management	30
	Total	30

Preparations and material required none

- Procedure**
- 1. Introduction:** Besides actual land management practices which have a direct influence on the water and biomass cycles, external factors may indirectly influence the management and therefore the quality/condition of the cycles. Among these factors we may find legal, institutional, and socio-economic aspects, such as eg. the influence a law of inheritance has on current land management practices, or the influence of specific culturally shaped values and attitudes which foster a certain type of land use practices.

Typical for this type of aspects is that (individual) land users hardly can change them as these are framework conditions that shape land use in the local context.

- 2. Plenary discussion:**
During the transect walk, and in previous discussions such external factors that can hamper sustainable land management might already have emerged. Initiate a discussion to identify such external factors.

Questions:

- Which external factors hamper sustainable land management?
- How could they be overcome?

Write the identified factors on a card each and stick them inside the cycle or beside it.

- Conclusions** Cycles can be disturbed by:
- inadequate laws and regulations,
 - inadequate policies,
 - market influences,
 - inadequate infrastructure (eg. irrigation, tourism infrastructure, etc.)

Step 5: Diagnosis of the cycles

- Objectives**
- To synthesise and interpret the situation / condition of the water and the biomass cycles in the study site.
 - To identify the main deficiencies / disturbances in the cycles.

Duration		Minutes
	1. Introduction	5
	2. Synthesis by the moderator	20
	3. Identification of most important problems / solutions, and 'entry points'	20
	Total	45

- Preparations and material required**
- Both cycles, as developed in Exercise 2 must be pinned to the wall.
 - Self-adhesive points: two colours, about 60 points per colour → only if the group work method is used to identify the most important problems and solutions

- Procedure**
- 1. Introduction:** The moderator introduces the notion of diagnosis referring to the example of a medical doctor who, based on the symptoms a patient shows/suffers from, makes a diagnosis on his health status. The same we can do with the water and the biomass cycles. Based on the analysis of disturbances and applied solutions we can make a diagnosis of the status of the cycles, and identify the most critical points, i.e. where no or not good enough solutions exist.
 - 2. Synthesis:** the moderator briefly summarises what has been developed in the course of Exercise 2 and in the presentations and discussions. Summarise the results of the different steps and interpret the picture that has evolved concerning the current state of the two cycles. The following questions may guide you:
 - Where are the main disturbances in the cycles? How do they influence each other?
 - Which / where are the main leakages concerning availability of water and nutrients?
 - Which solutions are applied locally? For which disturbances are there solutions, for which none or not good enough ones?
 - Which are the consequences / impacts of current land management to be expected in the future? Which trends to expect?
 - For each cycle, which are the most critical points that need most urgent remediation / solutions?
 - Which are the most important socio-cultural, legal or institutional factors hampering sustainable land management? What could be done?

3. Plenary or group work: identify the main problems and solutions for each cycle. Identify 'entry points' for each cycle.

Complete the information: Start by asking whether there are important locally applied solutions or strategies which have not yet been mentioned or documented?

If yes, add them on cards and stick to the respective cycle.

For each of the two cycles the **3 main problems** and the **3 most important / most effective solutions** need to be identified.

Depending on the time you have, you can **either** do it as a group work or discuss and decide in the plenary.

- **Plenary:** discuss and decide (consensus, voting) on the 3 most important problems and solutions. Mark them.

- **Group work:** split into 2 groups (the same as before working on their respective cycle each). Each participant gets 3 red and 3 blue self adhesive circles, red for problems and blue for solutions. Everybody marks those problems and solutions with the circles he considers to be most important. Sum up and identify for each cycle the 3 most important items.

Conclusions

- Cycles can be disturbed by inadequate land use techniques and practices.
- Cycles can also be disturbed by socio-economic, legal or institutional factors.
- Disturbances in the cycles have a negative impact on productivity, crop yields and returns.
- Disturbances in one cycle may lead to disturbances in the other cycle as the cycles are linked to each other.
- Disturbed cycles can be improved / remediated by adequate soil and water conservation technologies and approaches.
- There are local solutions to prevent land degradation / to maintain and increase soil fertility / to increase the production of biomass / to reduce the loss of soil water, etc, etc.
- Different types of interventions / strategies are necessary to improve the cycles: besides soil and water conservation technologies other measures might be required such as for instance legal measures, awareness creation, change of attitudes, etc.

Expected results

- A list of most important problems and most important /effective solutions
- At the end of exercise 2 the group will have identified possible and already applied solutions for some of the problems (disturbances and causes) but not for others, which gives important information on inputs required from external participants who are going to participate the third day of the workshop.

Thematic sheet

The cycles

→ for Exercise 2

Water, nutrient and biomass cycles

Exercise 2

The cycle – a basic principle in nature

The cycle is a basic principle in nature. Different types of natural cycles regulate life on earth. Day and night result from earth's rotation on its own axis. The moon orbiting the earth regulates tides and influences the biorhythm of living beings. Changing seasons result from the earth orbiting the sun. The same is true for ocean currents, winds, thermodynamics and the general weather situation. The water cycle regulates evaporation and precipitations and the life cycle secures the continued existence of living beings and their constant adaptation to changing environments.

Cycles are linked to other cycles

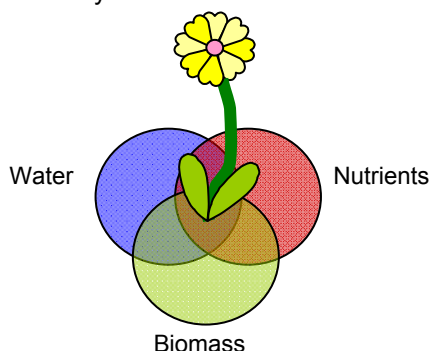
Cycles are linked to other cycles. Hence the performance of one cycle may influence the performance of another cycle.

Links between the water and the nutrient cycles

The water cycle is connected with the cycle of plant nutrients. Plants can only absorb nutrients dissolved in water. Hence, a sufficient level of soil humidity is a precondition for the development of the full diversity of potential vegetation cover. Decomposition, the process that releases nutrients bound to the organic matter of dead plants, only occurs if the level of soil humidity meets the requirements of micro-organisms in the soil.

Cycles decisive for agricultural production

Agricultural production is strongly dependent on the interplay of three cycles, i.e. the water, biomass and nutrient cycles!



The size of the intersection between the water, nutrient and biomass cycles decisively influences plant growth and crop yields to be expected.

Intact cycles – a prerequisite for good yields

The current state of natural cycles and their interplay strongly influence the quality and quantity of agricultural production. Thus, **good crop yields depend on intact natural cycles and a sustainable use of natural resources.**

A balance between production and reproduction has to be found and the ability for regeneration of an ecosystem maintained

Disturbances and leakages

Unsustainable use of natural resources leads to disturbances / disturbances in natural cycles that negatively influence their performance. An example is the depletion of nutrients in the soil: if all the biomass produced on a field is removed and no nutrients are added (either manure / mulching or mineral fertiliser), the soil gets depleted and tired.

Desertification and land degradation Human activities influence the cycles

Desertification and land degradation are the effects of disturbed / perturbed cycles.

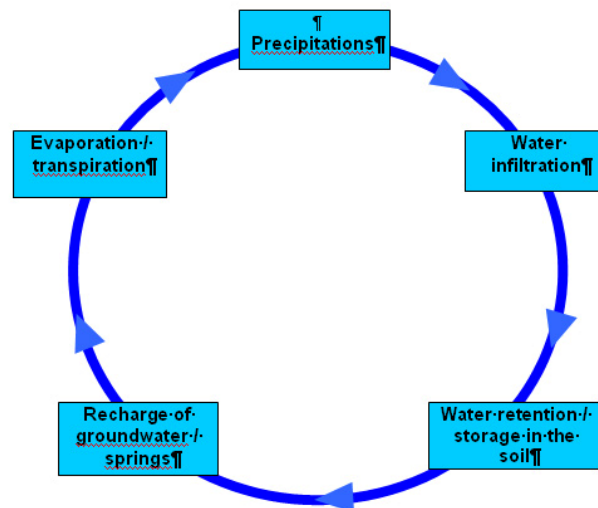
Human activities increasingly intervene in natural cycles and change their dynamics positively or negatively.

Positive changes	Negative changes
Stimulation / activation of the cycle	Acceleration of cycles
Strengthening links between complementary cycles	Deceleration of cycles
	Break / interrupt a cycle
	Introduction of pollutants and hazardous substances into cycles
	Disconnecting complementary cycles

The water cycle

Basic stages in the water cycle

The principle or schema of the water cycle is basically the same all over the world. However, regional differences exist as far as time periods, specific processes and intensity is concerned. The water cycle basically consists of the following stages: precipitation – water infiltration – water retention/storage in the soil - recharge of groundwater / springs – evaporation / transpiration / clouding, and then a new round starts with precipitations.



Man-made disturbances in the water cycle

There are manifold ways how human beings influence or interfere at the local, regional and global levels with the natural processes of the water cycle. Examples are: the construction of dams and water reservoirs; man-made changes in the course of water bodies; water abstraction from water bodies and groundwater; irrigation; sealing of soil surfaces; burning of vegetation cover, etc.

These interventions often result in different disturbances in the natural water cycle and negatively affect the interactions between the water cycle and other cycles such as the biomass and nutrient cycle.

Disturbances and their effects / impacts vary regionally

Although the basic schema of the water cycle is the same, disturbances in the cycle and their impacts may vary greatly from one region to another. The following table presents a few examples of disturbances, their causes and effects / impacts:

	Disturbance	Causes	Effects / impacts
Precipitation	Increase or decrease of precipitations; Increasing rainfall variability	Climate changes; changes in ocean currents, wind directions, air humidity, thermodynamics, etc.	Drought / floods
Water infiltration	Sealing of soil surfaces	Decreasing vegetation cover due to overuse, deforestation, burning; Poor soil structure; bad use of slopes; Buildings and construction work.	Increase of run-off; a decrease in the amount of water stored in the soil etc.
Water retention / storage in the soil	Reduced storage capacity	Reduced water retention capacity; insufficient supply of soils with organic matter; sandy and stony soils	Fast drying of soils

	Disturbance	Causes	Effects / impacts
Recharge of groundwater and sources	Reduced recharge of groundwater tables and sources	Increased run-off, a decrease in the amount of water stored in the soil	Lowering of the groundwater, running dry of sources, drying of soils / reduced capillarity
Evaporation / transpiration	Increasing losses of water due to high evapotranspiration	Reduction in soil cover, cultivation of species with high evapotranspiration rates	Drying of soils, shortage of drinking and irrigation water, salinization.

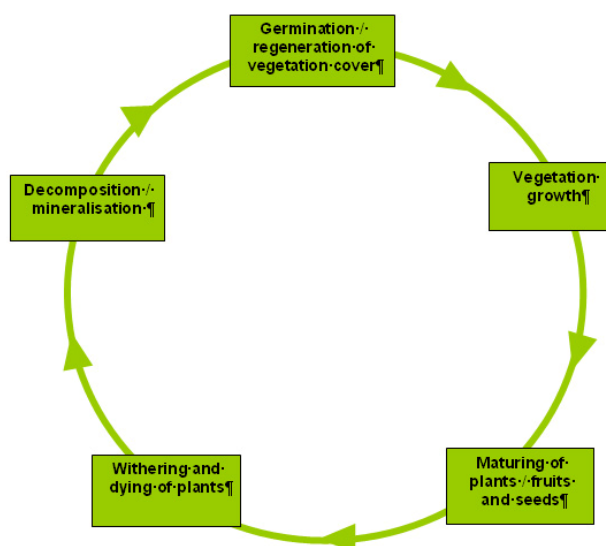
Causes and effects reinforce each other

Interactions between causes and effects of disturbances may aggravate the disturbance and finally lead to negative impacts on other linked cycles.

The biomass cycle

Basic stages in the biomass cycle

The biomass cycle resembles the basic life cycle and basically consists of the following stages: birth – growing – maturing and reproduction – dying – decomposition.



The biomass cycle is linked with the nutrient and water cycles

The biomass cycle is closely linked to the water and nutrient cycles. An example to illustrate the connection is the fact that the growing plants add organic matter to the soil and thus improve its water retention capacity. The vegetation cover also protects soils from drying. At the same time soil humidity allows that plants can absorb enough dissolved nutrients.

Man-made disturbances in the biomass cycle

As in the water cycle there are manifold ways how human beings influence or interfere with the natural processes of the biomass cycle, often with negative consequences. Examples are: overgrazing, the overexploitation of forests, and agricultural land, burning of vegetation cover, not adapted agricultural techniques, etc.

Disturbances, causes and impacts

The following table presents a few examples of disturbances in the biomass cycle, their causes and effects / impacts:

	Disturbance	Causes	Effects / impacts
Germination	Seeds don't germinate	Insufficient rainfall; no or badly developed seeds; no vegetative reproduction; animals important for germination are extinct; seeds destroyed by fire; cultivation practices hamper germination	Reduced biodiversity, poor vegetation cover, increased evaporation, high risk of wind and water erosion
Plant growth	Slow / reduced plant growth	Drought, poor soils	Low vegetation cover, increased evaporation, high risk of wind and water erosion
Maturing of plants / fruits and seeds	Plants don't reach maturity or only to a limited extent; low reproduction rates	Destruction of vegetation cover by fire, overuse, floods, drought	Low vegetation cover, increased evaporation, high risk of wind and water erosion
Withering and dying of plants	Early / precocious withering and dying of plants	Drought, floods, salinization; empoisoning of soil with pollutants, lack of nutrients	Low vegetation cover, increased evaporation, high risk of wind and water erosion
Decomposition / mineralisation	Reduced speed of decomposition and mineralisation of organic matter	Lack of micro-organisms; lack of soil humidity	Accumulation of inflammable organic matter, reduced availability of nutrients.

Causes and effects reinforce each other

Interactions between causes and effects of disturbances may aggravate the disturbance and finally lead to negative impacts on other linked cycles.

Locally applied solutions for soil and water conservation

Locally applied solutions to mitigate the disturbances in the cycles comprise all activities at the local level which maintain or enhance the productive capacity of the land in areas affected by or prone to degradation. Soil and water conservation (SWC) includes prevention or reduction of soil erosion, compaction and salinity; conservation or drainage of soil water; maintenance or improvement of soil fertility, etc.

The nutrient cycle

The nutrient cycle is very closely linked to the biomass cycle. It will not be further explored in the module due to time constraints. This seems to be acceptable as with the biomass and the water cycle the two main issues concerning agricultural production, namely soil fertility and soil humidity (water availability), are covered well enough regarding the objectives of the stakeholder workshop.

Adverse effects of external factors (→ Step 4)

External factors influence the cycles

The vitality of natural cycles not only depends on the way local land users make use of natural resources; the cycles are also exposed to the influence of a wide range of external factors. These may be economic, socio-cultural, political or legal factors and they can considerably influence bio-physical processes of the cycles. The influence may be positive or negative, and may lead to an increase or decrease of returns/yields from agricultural production. The following table presents examples of relevant external factors:

Economic factors	Social factors	Political factors	Legal factors
Market prices	Migration	Political priorities in (regional) development planning	Land rights (use and property rights)
Subventions, incentives and other steering mechanisms	Population pressure	Allocation of resources for extension services	Law of inheritance
Access to markets	Traditions, attitudes and behaviour	Tasks and focus of extension services	Legal protection of natural resources
Land market and speculation	Gender disparities	Agricultural policy	
	Poverty	Environmental policy	
	Division of labour		
	Awareness raising and education		

Possible adverse effects

- **Land rights and law of inheritance:** Antiquated or maladapted land and property rights can hamper the implementation of soil and water conservation techniques, or they can even force land users to use unsustainable cultivation practices.
- **Land market and speculation:** Ever increasing prices for land and speculation may lead to purposely provoked forest and bush fires.
- **Market prices:** High market prices of certain products may lead to monoculture, unfavourable cultivation practices or the cultivation of crops that don't suit the natural conditions.
- **Infrastructure maintenance:** Insufficient or lacking financial resources for the maintenance of irrigation or drainage infrastructure may lead to high water losses, water logging or soil salinisation.

Positive effects

On the other side, a set of concerted and targeted economic, political, and legal measures, combined with education and training may reduce disturbances and contribute to the strengthening of natural cycles, which will have a positive impact on production and returns.

→ For comments on the roles and responsibilities of different stakeholders in a concerted overall strategy for sustainable land management see '*Thematic sheet: Stakeholders*'

Diagnosis of the cycles (→ Step 5)

Diagnosis of the cycles

The diagnosis of the cycles is the basis for:

- An assessment of the risk of soil degradation / desertification and its impact on agricultural production and yields;
- The identification of already applied and potential new solutions for mitigating disturbances in the cycles;
- The identification of adequate measures (technologies and approaches) for the vitalisation of the cycles and their interplay.

Focus of the diagnosis

The diagnosis of the cycles focuses on the following questions:

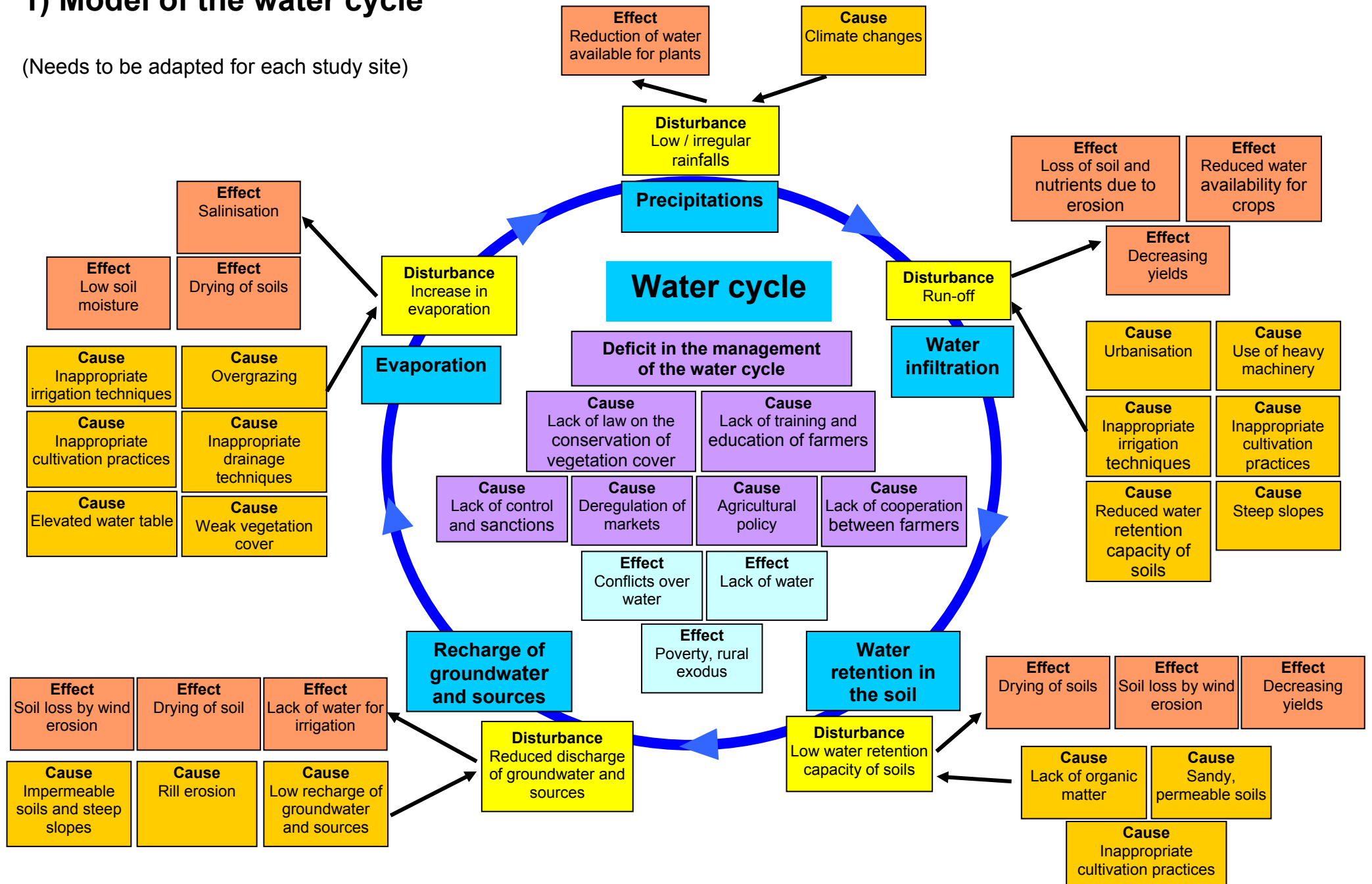
- Which are the main / most severe disturbances in the natural cycles?
- What causes them?
- Which effects do they have?
- How could the cycle be vitalised and strengthened? Which problems / disturbances need to be resolved?
- Which soil and water conservation technologies could be used to reduce / resolve the problem?
- Which external factors need to be changed, and how, to support the positive effect of technologies?

Rehabilitation and conservation strategy

Based on the diagnosis of the cycles and their interplay, an appropriate overall strategy for the prevention of soil degradation / desertification and the rehabilitation of degraded land can be developed / drafted.

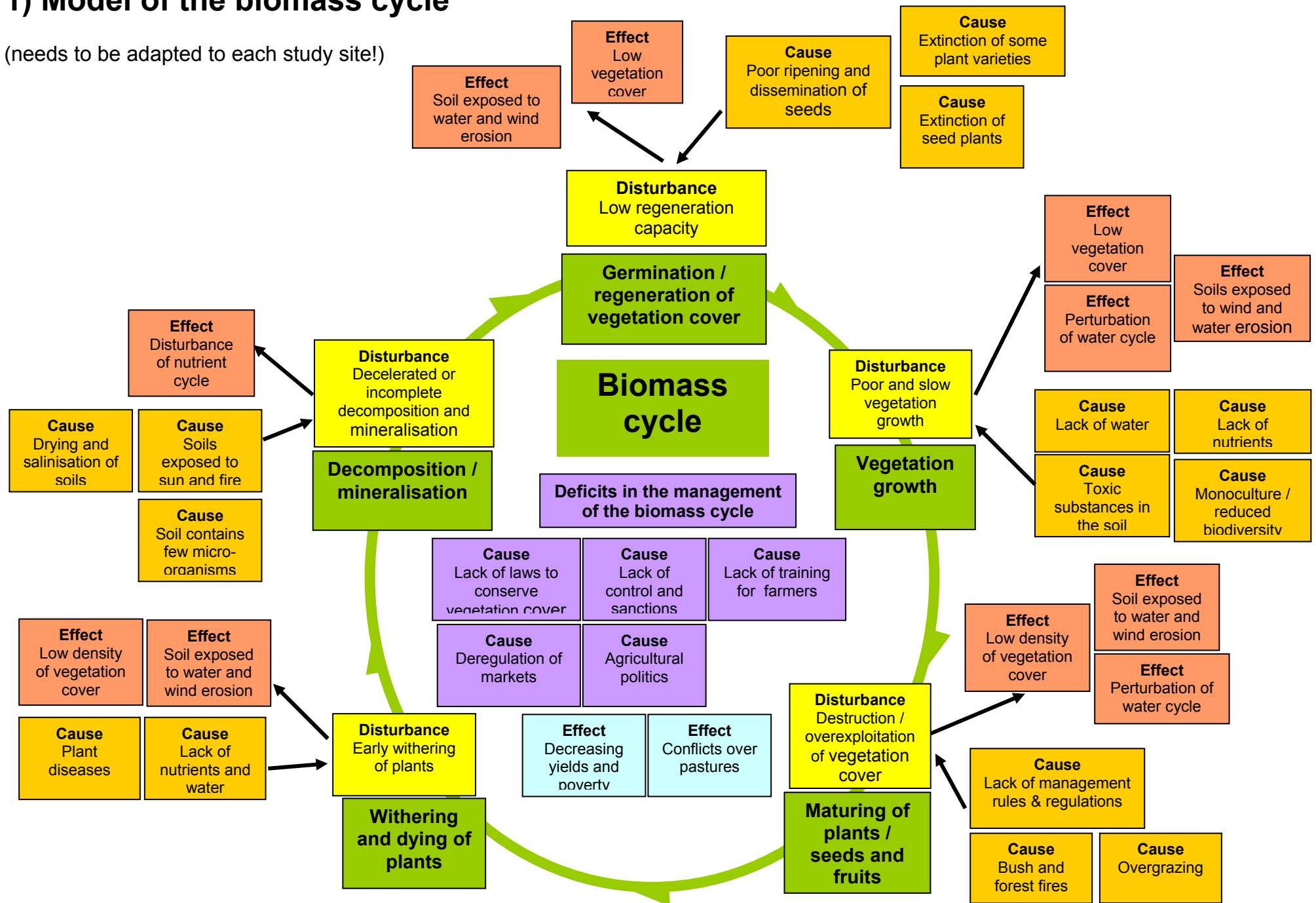
1) Model of the water cycle

(Needs to be adapted for each study site)

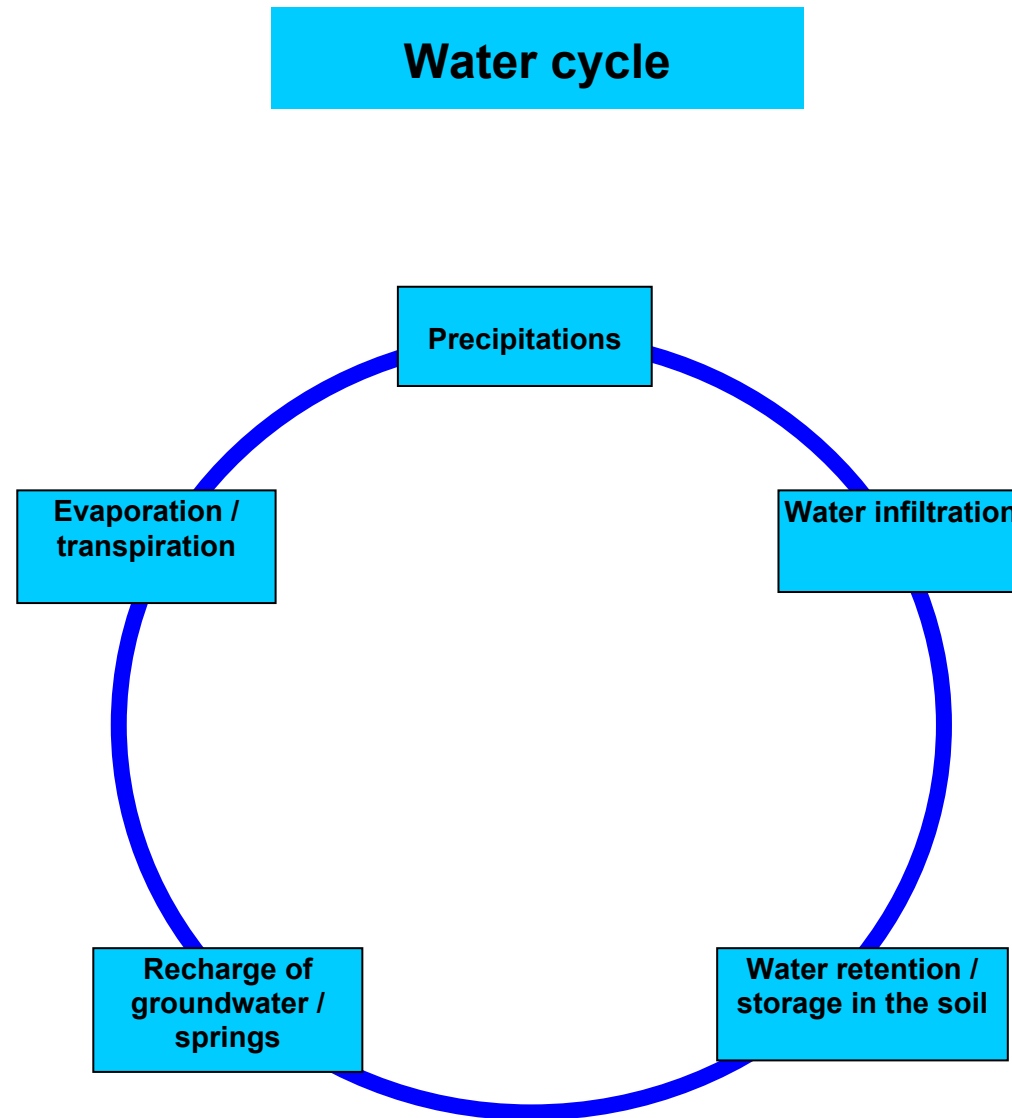


1) Model of the biomass cycle

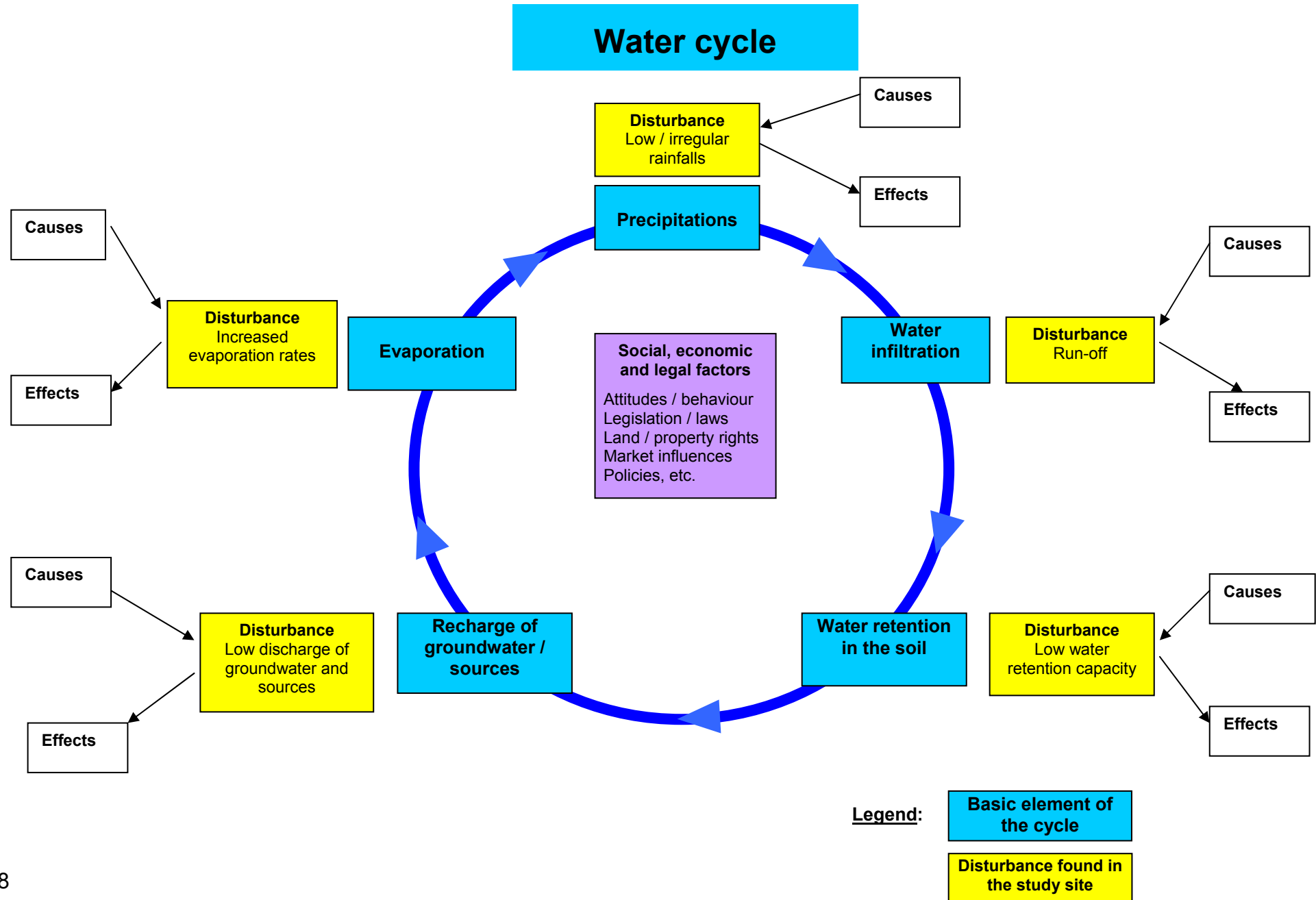
(needs to be adapted to each study site!)



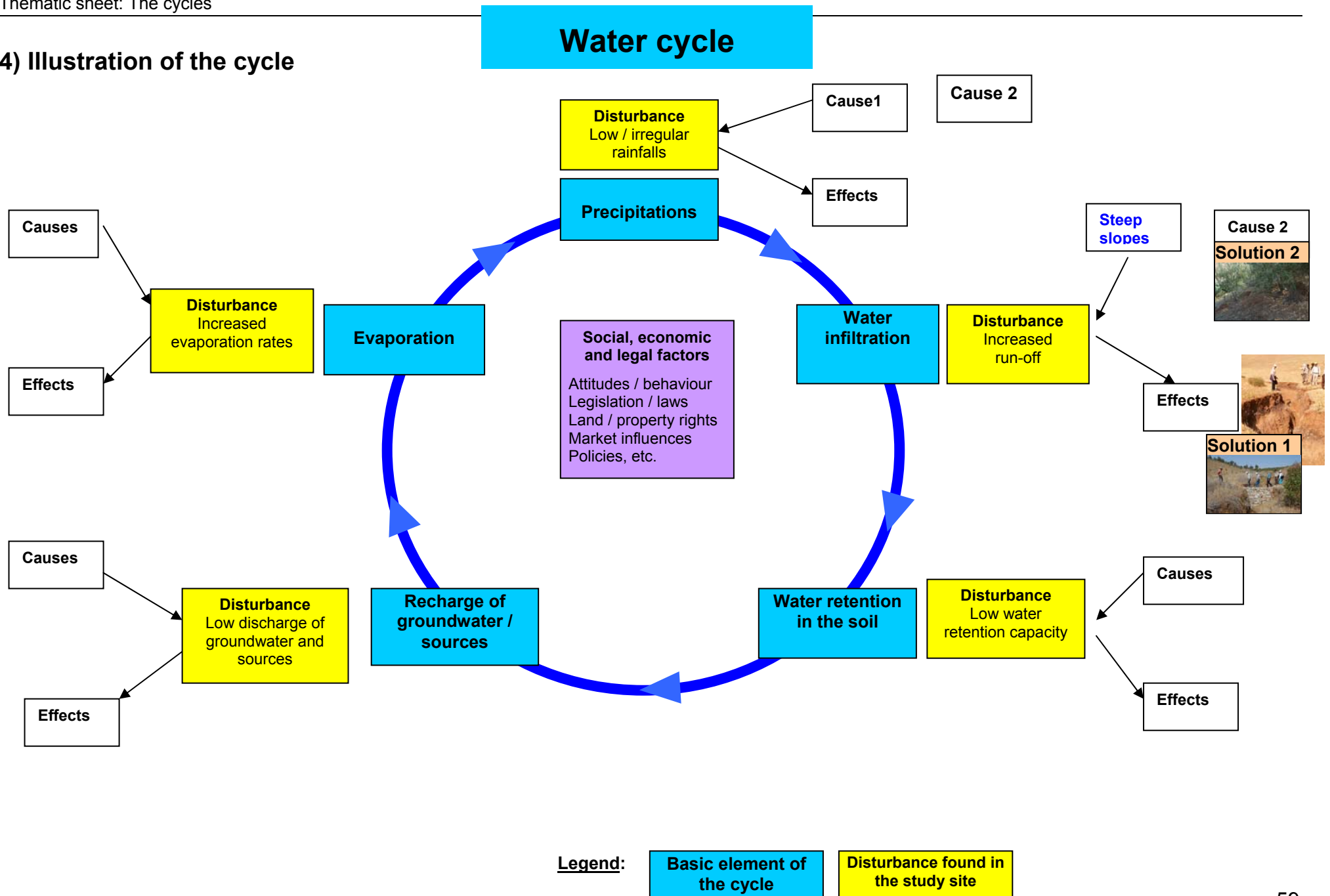
Basic elements



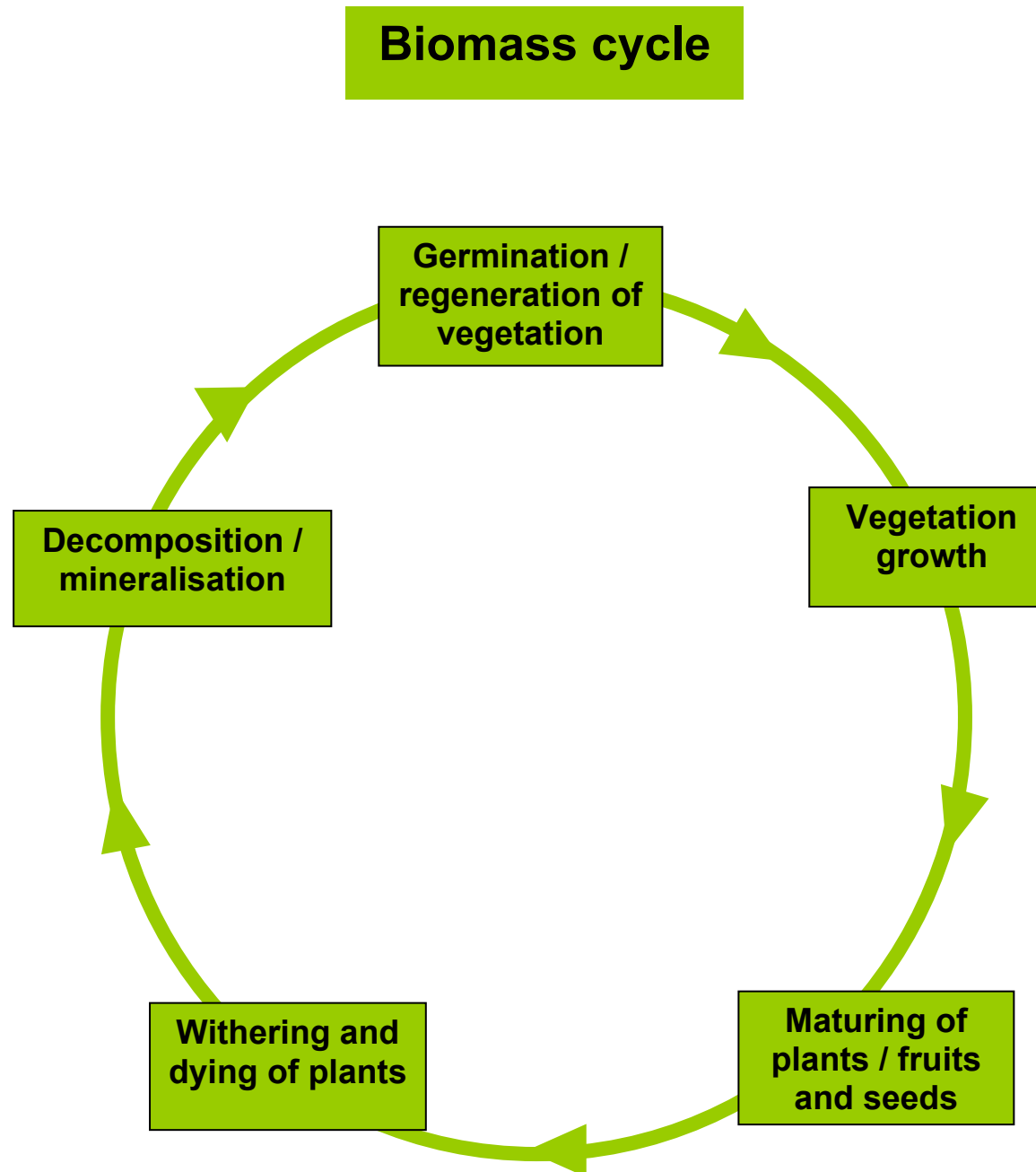
Basic elements and disturbances



4) Illustration of the cycle



Basic elements



Exercise 3: Local indicators for land degradation and conservation

- Objectives**
- To identify indicators used by local stakeholders to recognize land degradation processes and land conservation respectively.

Duration

	Minutes
1. Introduction	5
2. Plenary session: indicators for land degradation and land conservation	30
Total	35

- Preparations and material required**
- Paper sheets, format A 1
 - Markers (different colours)

Methodology Plenary discussion

- Procedure**
- 1. Introduction:** explain the notion of 'indicator'. An indicator is a sign for something. Indicators are used to make a judgement on the status of something and to know whether changes are occurring.
What does a land user look at / observe / measure to judge:
 - the quality of a cow /sheep? (Ex. Weight, teeth, udder, etc.)
 - the quality / fertility of a certain soil?
 - Recall the indicators / signs for land degradation already identified during the transect walk.
 - This exercise aims at identifying further indicators which are used by local people. Discuss in the plenary:
 - a) indicators for land degradation** and
 - b) indicators for land conservation / sustainable land management**

The following questions may guide the discussion:

Indicators for land degradation processes: (eg. soil structure, vegetation cover, specific plants, etc)

 - How would we know if things were getting worse?
 - What would you need to look at in order to find out?
 - What would you need to count or measure in order to find out?

Indicators for land conservation / sustainable land management: (eg. soil structure, vegetation cover, specific plants, soil life, etc)

 - How would we know if things were getting better?
 - What would you need to look at in order to find out?
 - What would you need to count or measure in order to find out?
 - List the identified indicators.
- Expected results**
- Participants are aware on indicators that point to positive or negative changes in land management practices / in degradation processes.
 - A list of locally used indicators.

Exercise 4: Stakeholders, their influence on and motivation to implement sustainable land management

- Objectives**
- To identify the stakeholders relevant for sustainable land management.
 - To identify their motivation (and interest) for sustainable land management.
 - To identify their influence / power concerning the implementation of sustainable land management.
 - To estimate the result / impact of this constellation of motivation and influence.

Duration		Minutes
	1. Plenary session: Brainstorming stakeholder list	15
	2. Plenary session: visualisation of influence and motivation	60
	3. Plenary session: interpretation and conclusions	15
	Total	90

- Preparations and material required**
- Paper sheets, format A 1
 - Cards, format A5; markers
 - Prepare the table, and the matrix (see below)

- Methodology**
- Plenary session:** brainstorming
Plenary session: fill in table and visualise
Plenary session: interpretation and conclusions

- Procedure**
1. **Plenary session:** The moderator explains the exercise.
 2. **Plenary session:** Brainstorming to identify the stakeholders / stakeholder groups (individuals, groups, organisations, institutions) which have a direct or indirect influence on land use in the study site. Ask the following question:

Whose decisions and actions do have an influence (positive or negative) on land use in the study site?

Appoint somebody to write down each stakeholder / stakeholder group on a separate card (or post-it note) and pin them to the wall. Revise the cards to see whether some are overlapping or others missing.

To be considered: It is important to identify **different categories of land users / farmers**, eg. according to their wealth / farm size, production orientation, or land use and property rights (land ownership, leased land, share-cropping etc.). Their motivation as well as their possibilities to take decisions and implement soil and water conservation might be very different! (→ see also thematic sheet on 'Stakeholders')

3. **Plenary session:** In the next two steps the group identifies for each of the stakeholders how big his **motivation to implement sustainable land use** is, and how big their **influence on land use** is.
 - Copy the names of stakeholders to the pre-prepared table.
 - Start working on the **1st column** (motivation). Ask for each stakeholder: **How is his / their motivation to implement sustainable land management?** Fill in the table.
 - Continue with the **2nd column** (influence). Ask for each stakeholder: **How do his / their decisions and actions influence the sustainability of land use?** Fill in the table.

- In the **3rd column** 'comments' write down valuable information on particular motivations of the respective stakeholder, obstacles faced in the implementation of sustainable land management, etc.

Be aware that sometimes it can be difficult to identify motivation and influence of a stakeholder (group), as these may change or even be contradictory according to the situation or a specific question. Example: The influence of the Forestry Service might vary strongly depending on whether we talk about private forest land, or state forests! In these cases you may judge the same stakeholder for different situations.

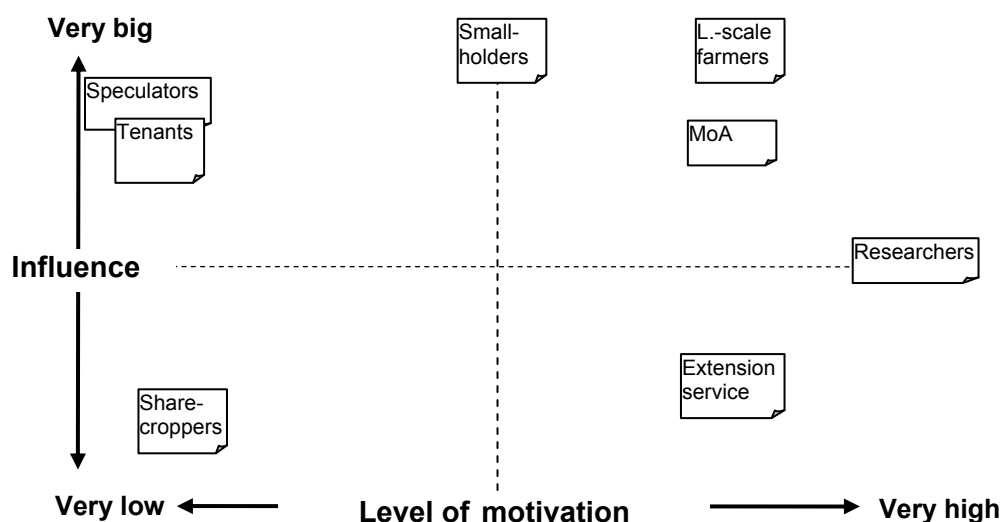
Example:

Stakeholder / stakeholder group	How is their <u>motivation</u> to implement sustainable land management?	How is the <u>influence</u> their decisions (and actions) have on the sustainability of land use?	Comments
Small-holders	medium	big	Obstacles: high degree of dependency on off-farm income
Large-scale farmers	big	very big	Many innovators Large-scale = 70% of cultivated area
Tenants	Very low	Big	No property rights → no structural measures possible
Extension service	big	low	Only reach part of the farmers
Ministry of Agriculture	big	big	
Land speculators	Very low	big	Raising land prices!
Researchers	Very high	medium	'translation' of research results into action is slow
Sharecroppers	Very low	Very low	
Etc.			

- Plenary session:** The next step is the visualisation of the table and optional, as the planned time for the exercise is tight. To save time it is advised that two moderators work together, i.e. while one fills in the table, the other already positions the stakeholders in the matrix below.

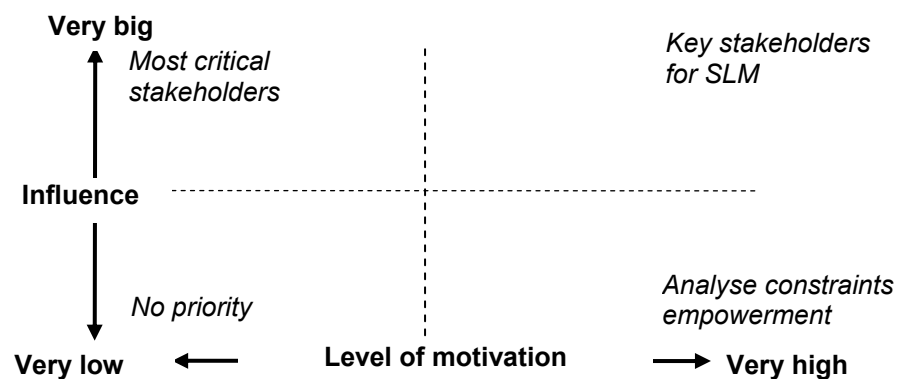
Visualise the repartition of influence and interest by arranging all stakeholder (groups) according to their influence / interest, and motivation in the following matrix:

Example



5. **Plenary session:** Discuss the meaning of the matrix. The following questions may lead the discussion:

- Who are the key stakeholders for the implementation of sustainable land use? (very big influence, very high motivation) → *key stakeholders*
- Who is strongly motivated but lacks influence? What are their constraints or obstacles, and how can they be overcome? → *need empowerment, support*
- Which stakeholders have the power to obstruct sustainable land use? (very big influence, very low motivation) How is it possible to 'get them on board', or how has to be dealt with them? → *most critical stakeholders*
- Who has neither influence nor interest, and why? → *no priority*



Conclusions

- Not all stakeholders are equally important for the implementation of sustainable land management.
- Some stakeholders may be motivated to implement sustainable land use but they lack power and influence to do so.
- Stakeholders with a big influence and low motivation are most critical, as they can obstruct sustainable land use. Efforts should be made to get them on board!

Expected results

- Participants are aware of which stakeholder groups have what kind of influence concerning land management issues.
- Stakeholder groups are identified, who may strongly but very indirectly influence current land management practices, and who need to be considered in a strategy for sustainable land management.
- The stakeholder analysis may lead to the conclusion that important stakeholder groups are not represented in stakeholder workshop 1, and that additional efforts are necessary to get them on board.

Thematic sheet

Stakeholders

→ for Exercise 4 and 8

Stakeholders

Exercise 4 and 8

Cooperation and concertation

Sustainable land management (eg. in a study site) requires efforts from different stakeholders at different levels of decision-making and action:

- farm level: cultivation practices, management of the natural cycles, conservation measures, use of natural resources, etc.
- administrative level: laws and regulations, incentives, extension, education and training, etc.

Cooperation between different stakeholders and concerted strategies and measures are essential for sustainable land management.

Decisions at the farm level

Many important decisions concerning the use and management of natural resources are taken at the farm level, such as whether soil and water conservation technologies are implemented, whether laws and regulations on resource conservation are respected, or whether investments are made in the production of alternative crops or the development of new activities.

Heterogeneity of farms and farm households

At the global level about 85% of farmers are small-scale farmers focusing on subsistence production. In the DESIRE study sites this number may vary considerably. When talking about strategies, solutions and measures to implement it has to be considered that in a given study site different types of farms or farm households may exist, and that they do have different strategies.

Differences exist in regard to farm size (small-scale, large-scale), land property (land owners, leasers, share croppers, etc.), production orientation (subsistence, market), main crops (staple food, cash crops), proportion of crop production – livestock production, importance of farming in the household strategy (farm income – off-farm income), but also concerning their human and financial resources, level of education, etc.

These differences may strongly influence the ability and also willingness of a farmer to implement a certain conservation measure and have to be considered when talking about solutions and strategies!

Characteristics and risk of different household types

Small-holders / poor households		Large farms / rich households	
Characteristics	Risks / limitations	Characteristics	Risks / limitations
Weak social network	Little support in emergencies Little influence on decision-making processes at the local to national levels	Extended social network and relations	Assertion of self-interests Social tensions
Small farm size Little fertile land Few or no pastures	Overuse of arable land and pastures Use of marginal land Low level of food security Poverty Emigration of young family members	Large farm size Enough arable land	Low incentives for investments in conservation and intensification measures
Small number of livestock	Low reproduction rates Overgrazing	Big number of livestock	Very high reproduction rates Overuse of pastures
Difficult access to water	Lack of irrigation water	Good access to water	Intensive irrigation Lowering of water table
Indebtedness No or limited access to credits Lack of investment capital	Lack of means for investments in productive activities or conservation measures Few innovations	Access to credits Investment capital	Investments in activities with high, short-term returns Speculation

Small-holders / poor households		Large farms / rich households	
Characteristics	Risks / limitations	Characteristics	Risks / limitations
Simple equipment (tools and machinery)	Low labour efficiency High labour input	Access to heavy machinery and high-tech tools	Soil sealing Disturbance of soil structure
Little access to mineral fertiliser, improved seeds and pesticides	Low yields	Access to mineral fertiliser, improved seeds and pesticides	Excessive use of fertilisers and pesticides result in decreasing soil fertility (salinisation, contamination, etc.)
Lack of labour force	Opportunities can not be made use of	Enough labour force due to seasonal wage labourers	Small-scale farmers that are dependent on wage labour are late in working their own fields
Little access to information and education	No innovations Keep to badly adapted cultivation practices and techniques	Good access to information and education	Selective use of information and training for profit maximising activities
Low level of diversification of production	Dependency on few sources of income Highly vulnerability	Highly diversified sources of income Flexibility and minimisation of risk Specialisation	Dissipation of resources and decreasing productivity Increased risk due to highly specialised production or monocultures
Little access to markets	Low prices for own products	Easy access to markets Strongly market-oriented production	Dominant market orientation Neglect of criterias of sustainable land management

Obstacles that hamper sustainable land management

Obstacles in regard to sustainable land management are manifold, for example:

- At the farm level, the implementation of sustainable land use methods is often hampered by a lack of resources (labour force, tools, financial resources) and knowledge (technologies, practices for a sustainable use of natural resources).
- Organisational deficits at the farm level, and weak or lacking collaboration and cooperation of stakeholders at the local, regional, national and international levels hamper the development and implementation of conservation strategies.
- Framework conditions for the promotion of sustainable land management developed by the international community or the state often are not very suitable. An example: an 'outdated' inheritance law can lead to the situation that small-holders who don't have the means to compensate their co-heirs use land to which they do not have full rights of disposal. Thus, only few or no investments can and will be made in land conservation measures such as terraces, afforestation, agroforestry, etc.

Towards a strategy

A future-oriented strategy to reduce land degradation and desertification needs to combine technical measures (soil and water conservation technologies) and improving framework conditions (external factors) in a way that facilitates implementation. This can be for example: an efficient and competent extension service, fair market prices, improved market opportunities, income diversification (eg. through processing of products), fair credit conditions, etc.

→ see also *Thematic sheet: SLM strategy*

Stakeholders, roles and responsibilities

In Exercise 2, Step 4 (External factors: social, economic, political and legal aspects) it has been analysed how external factors influence natural cycles. The questions now are:

- How can these factors be steered / regulated, and by whom?
- What do different stakeholder groups need to undertake to influence the cycles positively, and to reduce / eliminate the deficits identified in the diagnosis of the cycles?

In a 1st step, all stakeholders which have a direct or indirect influence on land management have to be identified.

In the 2nd step it has to be identified which measures these stakeholders need to take to make land management more sustainable.

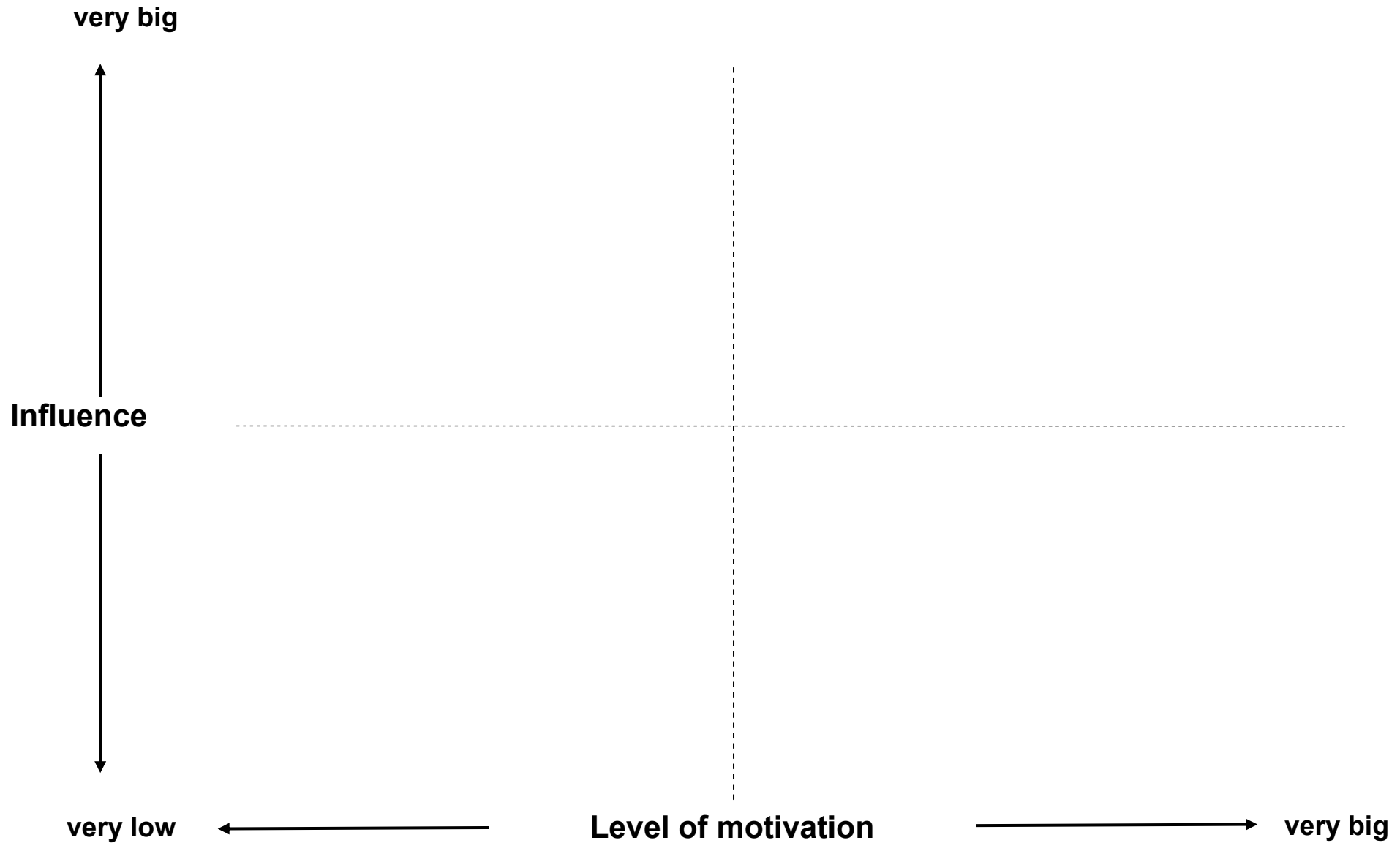
Stakeholders and their fields of intervention

The following table exemplarily lists stakeholders and their specific fields of intervention. The roles and responsibilities of stakeholders as well as their level of influence needs to be identified for each study site according to the specific local context.

Field of intervention	Stakeholder	Role and responsibility	Level of influence x = low xx = medium xxx = high
Implementation	Large-scale farmers	Implementation of technical and management measures	
	Small-scale farmers	Implementation of technical and management measures	
	Forestry services	Technical advise	
	Extension service	Training and consulting at the farm and community level	
	Local farmer associations	Collaboration in the implementation of technical measures, and of locally agreed upon rules and regulations	
	Planner / operator of infrastructure projects (street, train, dam, etc.)	Impact assessment of infrastructure projects on natural resources (soil, water, vegetation)	
	Spatial planner		
	Planner / operator of big service providers in tourism	Implementation of protective measures	
Policy	Ministry of Agriculture	Enabling measures eg. incentives, subventions, pricing policy, agricultural policy	
	Ministry of Environment	Environmental policy and enabling measures	
	Ministry of Finances	Allocation of financial resources, customs duty	
	Ministry of Economy	Economic policy and enabling measures	
	Economic and trade organisations	Lobbying, elaboration of draft laws	
Legislation	Parliament	Pass new laws and regulations	
	Ministry of Justice	Draft laws and regulations on: sustainable use of natural resources, inheritance, land rights	
	Police, technical services	Implementation of laws, controlling the observation of laws and decrees	
	Court	Sanction of infringements	
Information and training	Ministry of Education	Awareness building, information, technical training on sustainable use of natural resources and desertification risks	
	All levels of education: vocational training, adult education, etc.		

Research	Agricultural research institutions, universities, etc.	Research on technical, socio-economic, legal and political measures to mitigate land degradation, and to rehabilitate soils and regions at risk	
Civil society	NGOs	Supporting farmer associations, lobbying, training, etc.	
	Media	Public information, information on desertification and its impacts	
	Private businesses	Invest in and operate production and service providers which directly influence land management (construction, tourism)	
	Banks	Finance investments in activities which directly influence land management	

Exercise 4: Stakeholders, their influence on and motivation for sustainable land management



Exercise 5: Recapitulation of intermediate workshop results – preparation of presentations

- Objectives**
- Tomorrow, on the 3rd day of the workshop, external participants from NGOs, GOs, researchers and regional authorities are going to join the group. Before they can start to share their knowledge and perspectives with the group, they need to get an overview on what has been worked on during the first two days and which are important results and conclusions from the reflections made so far. The objective of this exercise is to recapitulate important information and conclusions agreed on, and to prepare the briefing of external participants.

Duration	Minutes
1. Introduction	5
2. plenary session	15
3. Group work	40
Total	60

- Preparations and material required**
- Tape all documentation material from previous exercises in a chronological order to the wall
 - Paper sheets, format A 1
 - Markers (different colours)

- Methodology**
- Plenary session:** introduction and explanation
Group work: prepare the presentations
Plenary session: presentation and discussion of group work

- Procedure**
1. **Plenary session:** Tape all group works and main conclusions (paper sheets from the first two days) to the wall, in a chronological sequence. The moderator leads the group through the 'poster exhibition' and briefly recapitulates and summarizes the discussions and main conclusions from each sequence.
 2. The plenary decides together on the most important information and conclusions to be presented to external participants in order to:
 - brief external participants on what has been done,
 - present the local perspective on the themes and issues treated, with a special focus on solutions for land degradation.
 3. **Group work** Form 3 groups: each group prepares the presentation of a specific sequence:
 - a) The water cycle: disturbances and local solutions; socio-cultural, legal and institutional aspects / constraints
 - b) The biomass cycle: disturbances and local solutions; socio-cultural, legal and institutional aspects / constraints
 - c) Stakeholders, their interest and influence in sustainable land management;

Each group appoints someone to make the presentation on the following day.

- Expected results**
- The main results from the first two days are ready to be presented.

Exercise 6: Presentation of intermediate workshop results

- Objectives**
- To welcome and brief external participants.
 - To present the local perspective.
 - To get first reactions from external participants.

Duration

	Minutes
1. Introduction	30
2. Plenary session: presentations and discussion	60
Total	90

- Preparations and material required**
- None
 - Keep paper and markers ready

- Methodology**
- Plenary session:** welcoming of external participants; introduction to the second part of the workshop
- Plenary session:** presentation of intermediate results and discussion

- Procedure**
1. Take enough time to **welcome the external participants** that join the group, and give everybody an opportunity to get to know each other or at least each others name. Let people briefly introduce themselves.
 2. The moderator recalls the **objectives of the workshop**, gives some explanations on the mode of work, and briefly checks expectations.
 3. Give a very brief **overview on the programme** of the first two days, and the third day.
 4. Each group makes its presentation. Allow 10 minutes for each group. It is important to state that the presentations represent the **internal view of local stakeholders**.
 5. **Plenary discussion:** invite external participants to give their reactions and comments, but do not enter into an in-depth discussion now!

The following questions may guide the discussion:

- Do you agree with the position identified for the **institution you represent**? If not, where would you position it?
- In view of the **disturbances** presented, which ones do you perceive to be the most urgent to be resolved, and why?
- In view of the **solutions** presented, where do you think that your institution could contribute its knowledge and support?

Make sure that the local view is appreciated and respected and that discussions are not too controversial at this stage. Otherwise local participants might feel questioned and the results of their work devaluated, and this would most probably have a negative impact on the working atmosphere during the second part of the workshop.

During the discussion, the co-moderator (second person) takes notes and documents possible contributions of the respective institutions.

- Expected results**
- Everybody is up to date on the reflection process done in the workshop so far.
 - Local participants present their view on land degradation and land conservation.
 - Hints on divergences between local and external views.

Exercise 7: Already applied and potential solutions to identified problems of land degradation

- Objectives**
- To identify technologies and approaches or other strategies not yet applied but potentially suitable for the local context.
 - To integrate the perspective, knowledge and experience of external stakeholders.
 - To briefly assess already applied and potential solutions.

Duration		Minutes
	1. Introduction: technologies, approaches in SWC	10
	2. Plenary session: complete list with local and potential solutions	40
	3. Group work: assessment	60
	4. Plenary: presentation group work	50
	5. Selection of 2-5 technologies / approaches	20
	Total	180

- Preparations and material required**
- Paper sheets, format A 1
 - Markers (different colours)
 - Stickers

- Methodology**
- Plenary session:** introduction (technologies, approaches)
Group work: assessment of strategies
Plenary session: presentation and discussion of group work. Prioritisation of potential technologies and approaches. Selection of technologies / approaches to be documented and evaluated in detail after the stakeholder workshop.

- Procedure**
- 1. Introduction:** introduce the notion of technologies and approaches in SWC (→ see Thematic Sheet '*SLM strategy*').
 - 2. Plenary session:** Take the list of locally applied solutions and complete it by inviting in a first round external participants, and then everybody, to share their experience and knowledge, and what they have seen in other places (with similar conditions) concerning successful SWC technologies. Which could be adequate and potentially interesting and feasible technologies / approaches / strategies for the local context? Make a list of potential options.
 - 3. Group work:** Form 2-4 groups (depending on the number of participants and listed options) with internal or external participants only. Local participants are going to assess local solutions while external participants assess potential solutions. Distribute the listed items among the groups so that each group works on 3 - 5 local or potential solutions.
 Discuss on strengths and weaknesses, potential and constraints of the selected item. Make a brief but critical assessment (→ see table below) considering the following elements:
 - necessary investments (labour, money)
 - positive and negative short term / long term effects / impacts
 - constraints / limiting factors
 - Does the selected item fit into the concrete local context?
 - Who benefits? Who loses?
 - Who already implements the technology?
 - What is required that more people start to implement?
 - etc.

4. **Plenary session:** presentation and discussion of group work.
5. **Plenary: Prioritization and selection.** Let the participants select the 2 to 5 most important local or potential solutions (technologies and approaches) to be documented and evaluated in detail after the workshop. **Most important means: has a high potential in the local context, is feasible and effective.**

Therefore, in the case of potential solutions first make sure (discuss) that they fit these criteria, otherwise take them out of the selection process.

Distribute stickers to everybody. The number of stickers is half the number of items to select from; i.e. if 8 local and potential solutions have been assessed, everybody gets 4 stickers; in case of 12 items everybody gets 6 stickers. Everybody is free how he wants to distribute his stickers. You may use the assessment tables, and if necessary add a new sheet of paper to put the stickers. After everybody has made his choice, count the stickers and write down the sum for each of the items. Those 2 – 6 with the biggest number of votes are selected to be evaluated in detail after the workshop.

Identify resource persons: For each of the selected items identify:

- Persons who already apply it, and
- Persons, who could possibly help in the documentation and evaluation process

Expected results

- A list of potentially interesting and feasible technologies, approaches and strategies adapted / adaptable to the conditions of the concrete local context.
- A selection of technologies, approaches and other strategies to be documented and evaluated after the stakeholder workshop.

Example

Technology	Land use type	Labour (initial and maintenance)	Costs (initial and maintenance)	Impact / Effectiveness						Limiting factors / constraints	Potential for the local context	Who already implements?	What is required that more people will implement?
				economic		ecological		Socio-cult.					
				ST	LT	ST	LT	ST	LT				
Mulching	Agric.	high	low	+	++	++	+++	-	++	Availability of biomass	++	Small-scale farmers without livestock Large-scale farmers	??
Terraces	Agric.	Very high	high	-	+++	++	+++	--	0	Use and property rights	0	Few rich farmers	Financial support Land titles
Veg. strips	pasture	medium	medium	+	++	-	+	++	+++	None	+++	Farmers with own pastures	Supply with high quality fodder grass
Etc.													

Legend:

ST = short-term **LT** = long-term

Labour and costs: very low, low, medium, high, very high

Impact / effectiveness:

+++ **++** **+** **0** **-** **--** **---**
 very positive positive slightly positive medium slightly negative negative very negative

Exercise 8: Synthesis – Outline of a strategy for sustainable land management

- Objectives**
- To create awareness on the need of a comprehensive strategy towards land and water conservation / sustainable land management.
 - To identify and discuss important elements for a draft outline of a SLM strategy for the local context.

Duration

	Minutes
1. Introduction	5
2. Plenary discussion	60
3. Conclusions	10
Total	75

- Preparations and material required**
- Paper sheets, format A 1
 - Markers (different colours)

- Methodology** **Plenary session:** introduction
Plenary discussion

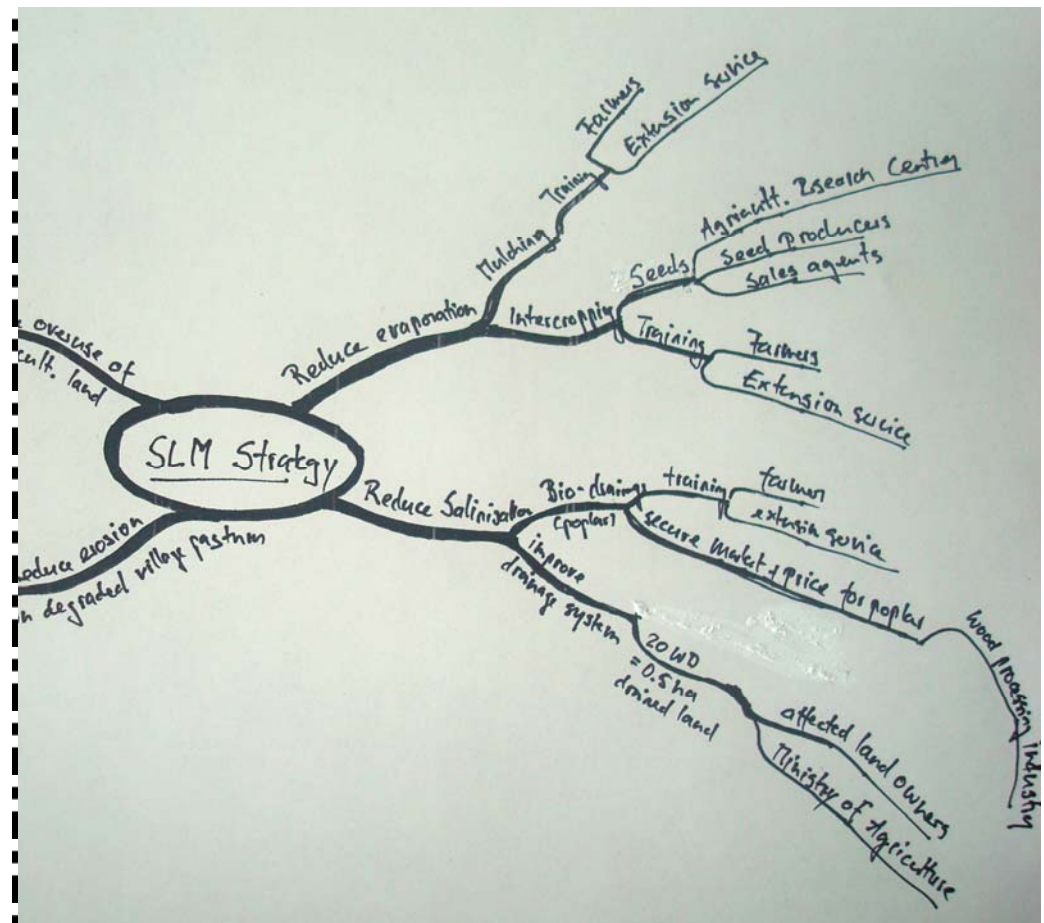
- Procedure**
- 1. Introduction:** Explain and illustrate the meaning and importance of an SLM strategy for the local context (→ see Thematic Sheet '*SLM strategy*'). The exercise aims at outlining a draft of such a strategy.
 - 2. Plenary discussion:** As a starting point for the discussion, refer to the disturbances in the cycles which are considered to be the most important / need most urgent remediation.
 - 1) From the disturbances deduce **objectives of the strategy** (→ see example in Thematic Sheet '*SLM Strategy*')
 - 2) Then identify for each of the objectives the **most appropriate technologies** (or: **what** needs to be done?).
 - 3) In the next step ask for **adequate approaches** to implement the technologies (or: **how?** By what ways and means?).
 - 4) **Who** are the stakeholders? (keep in mind results from Ex. 4!)

There are two possible ways of documenting the results of the discussion:
A) in a table:

Example

Objectives (Mitigation of disturbances in the cycles)	Appropriate technologies (What?)	Adequate approaches (How?)	Responsible stakeholders (Who?)
To limit water loss due to high evaporation	Mulching Intercropping	Training of extensionists and farmers Sale of adequate seeds Training of extensionists and farmers	farmers extension service farmers extension services ARC's seed producers sales agents
To limit / reduce soil salinisation	Improve drainage system to lower the water table	Farmers contributing 20 working days receive long-term use rights for 0.5 ha of drained land	Affected land owners Ministry of Agriculture
Etc.			

B) as a **mind map**:



Monitoring and evaluation:

After having developed a first outline of objectives, technologies, approaches and responsibilities try to think about how impacts of implemented solutions can best be monitored and evaluated? Which indicators to be used?

3. **Conclusions:** The moderator tries to summarise the discussion and emphasise the main tracks to be followed in future. Also recall socio-cultural, legal and institutional framework conditions which have to be considered, and which may strongly influence the appropriateness and choice of a technology.

- Conclusions**
- A SLM strategy is mainly comprised of objectives, technologies, approaches and involved stakeholders.
 - It links different stakeholders and different levels of decision-making and action.

- Expected results**
- Relevant inputs for the design of an overall strategy towards SWC that fits the concrete local context.
 - A preliminary outline of a strategy which serves as a basis for the follow-up process, especially the 2nd stakeholder workshop of WB3.

Thematic sheet

SLM strategy

→ for Exercise 8

A strategy for sustainable land management (SLM)

Ex. 8

SLM – a combination of technologies and approaches

In the course of previous exercises it became clear that sustainable land management (SLM) is best achieved by a combination of technical measures and the improvement of framework conditions for their implementation. In the WOCAT terminology we speak of 'technologies' and 'approaches'.

Technologies

A Soil and Water Conservation (SWC) technology consists of **one or more measures** belonging to the following categories:

- **agronomic** (eg intercropping, contour cultivation, mulching),
- **vegetative** (eg tree planting, hedge barriers, grass strips),
- **structural** (eg graded banks or bunds, level bench terrace),
- **management** (eg land use change, area closure, rotational grazing, rules and regulations).

Approaches

An approach defines **the ways and means used to promote and implement a SWC Technology** (whether indigenous or 'new') and to support it in achieving more sustainable soil and water use. A 'SWC Approach' - as defined by WOCAT - refers to a particular SWC activity, be it an official project/programme, an indigenous system, or changes in a farming system towards more sustainable soil and water use. It consists of the following elements:

- **All stakeholders** (policy-makers, administrators, experts, technicians, land users, i.e. actors at all levels),
- **Inputs and means** (financial, material, legislative, etc.), and
- **Know-how** (technical, scientific, practical).

An Approach may include different **levels of intervention**, from the individual farm, through the community level, the extension system, the regional or national administration, or the policy level, to the international framework.

Technologies and approaches go together

The implementation of technologies is always carried out with a specific approach. That means, each technology can be related to a specific approach; but the approach (ways and means of implementation) may vary from one place or context to another, from one period of time to another.

Identification of new potential solutions

In a 1st step already applied technologies and approaches will be identified, described and evaluated (be the means of the WOCAT questionnaires). If - in view of important problems/disturbances identified in the diagnosis of the cycles - no adequate solutions are available at the local level, the WOCAT data base can be used to identify potentially promising solutions (technologies and approaches) which proved to be effective in other regions with similar bio-physical and socio-economic conditions.

Strategy development

A strategy consists of objectives, and a defined procedure of how to reach these objectives.

In the process of developing a strategy for sustainable land management the following questions need clarification:

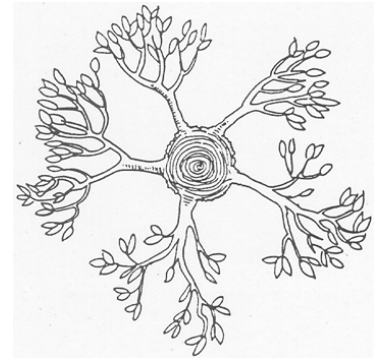
- Which are adequate technologies to remedy current deficiencies / disturbances identified in the diagnosis of the cycles? → vitalisation of the cycles
- Which approaches are most effective for an efficient implementation of the selected technologies?
- How can solutions be implemented efficiently? → planning
- How can the impacts of implemented measures best be monitored and evaluated?

Example of a SLM strategy

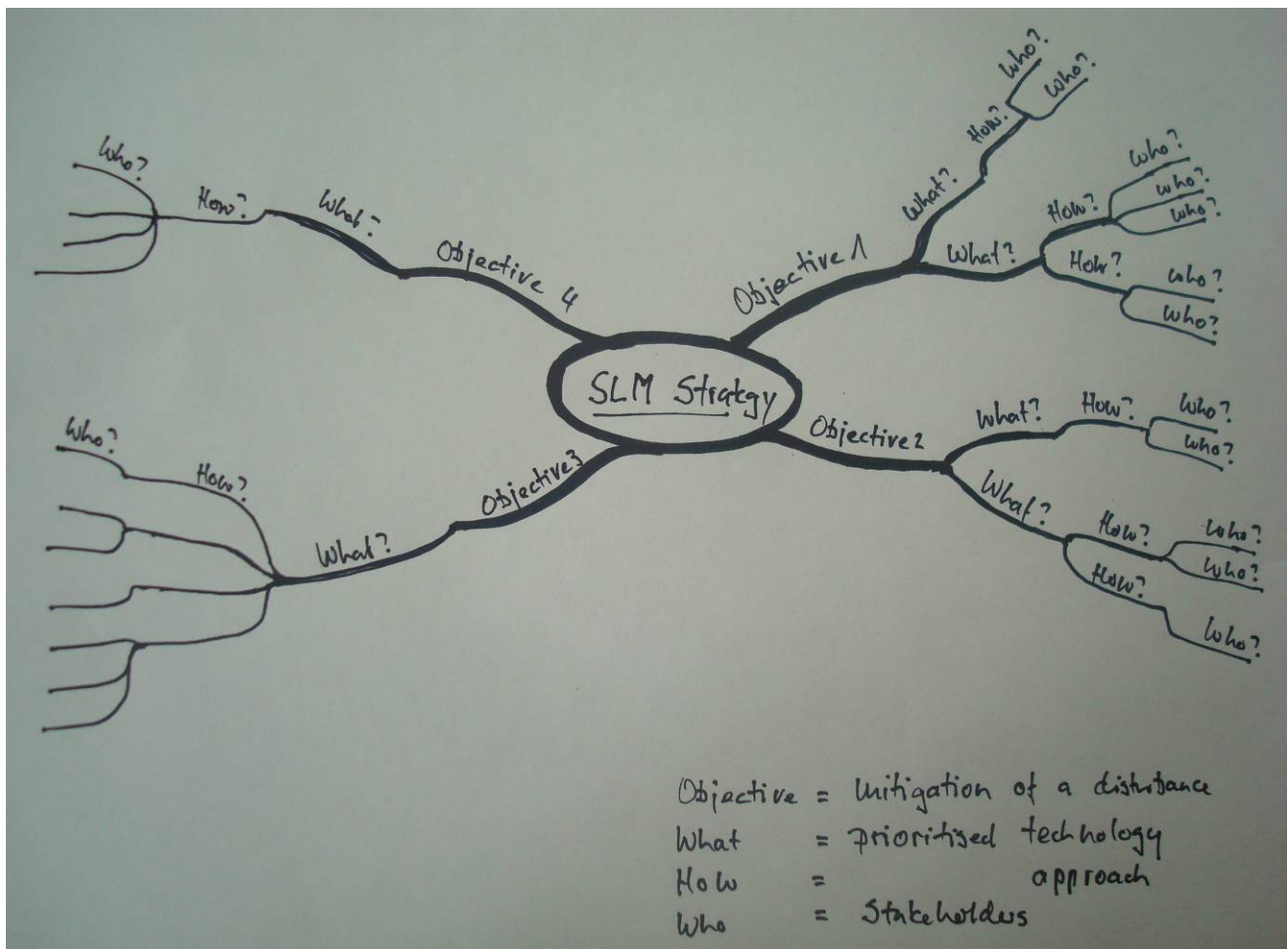
Objectives	Appropriate technologies	Adequate approaches	Responsible stakeholders
(Mitigation of disturbances in the cycles)	(What?)	(How?)	(Who?)
To limit water loss due to high evaporation	Mulching	Training of extensionists and farmers	farmers extension service
	Intercropping	Sale of adequate seeds Training of extensionists and farmers	farmers extension services agricultural research centres producers of seeds sales agents for seeds
To limit / decrease soil salinisation	Improve drainage system to lower the water table	Farmers who contribute 20 working days receive long-term use rights for 0.5 ha of drained land	Affected land owners Ministry of Agriculture
	Bio-drainage	Training of farmers and extensionists in bio-drainage through poplar tree cultivation	farmers extension service
To limit water and wind erosion on overgrazed village pastures	Rotation between nearby and distant pastures	Secure market and prices for poplar wood	Wood processing industry
		Limit the number of livestock units on nearby pastures (village pastures)	Communal authorities
		Grazing fees on village pastures	Communal authorities pastoralist association pastoralist association
To reduce the overuse of agricultural land	Decrease current pressure on land	Organise the supply (food, medicine, information) of herders families on distant pastures	pastoralist association Communal authorities Ministry of livestock economy farmers Tour operators Institute of Food Technology Distributors of food
		Long-term grazing rights on mountain pastures	
To reduce the overuse of agricultural land	Decrease current pressure on land	Develop alternative sources of income for rural small-holders (e.g. Community Based Tourism, processing of farm products)	farmers Tour operators Institute of Food Technology Distributors of food

As a possible form of illustrating the elements of the strategy we suggest a **mind map**.

A mind map is structured like a tree with a **core issue** at the centre and a number of main branches (**key issues**), which split into finer ones etc.



To illustrate the table (see above), the following structure is suited.



Exercise 9: Evaluation and closure of the workshop

Objectives - Evaluate contents, methodology, and results of the workshop.

Duration

	Minutes
1. Evaluation	30
2. Closure of the workshop	10
Total	40

Preparations and material required

- Paper sheets, format A 1, cards
- Markers (different colours)
- Write each question on a separate A1 sheet of paper

Methodology Plenary session

- Procedure**
1. Give each participant cards to write on. State a few concrete questions to be answered covering the issues of results/contents, methodology / didactics, and organisation of the workshop. Write them on A1 sheets and stick them to the pin-board.

The following questions may be used:
 1) What are your benefits/gains from the workshop in terms of understanding the problem of land degradation?
 2) What are your benefits/gains from the workshop in terms of understanding the meaning of sustainable land management?
 3) How did you like the way of learning and working (methodology) in the workshop?
 4) Which suggestions do you have to improve the organisation of the workshop?
 2. Give 10 minutes to write down the answers. Ask people to use for each question a separate card. In case not everybody is literate make sure that those in need of assistance do get it from other participants.
 3. Collect the cards, read them loudly and stick them to the respective question. Do not initiate a discussion on what has been written unless there is something really severe which needs clarification.
 4. **Closure of the workshop:** Start by giving a brief outlook on the next steps of DESIRE WB3 activities in the study site. Inform on the continuation of the local level process in the context of the DESIRE Project.
 5. Officially close the workshop and thank all participants for their valuable collaboration.

Expected results

- A feedback from workshop participants: what they liked / disliked, what they found useful / useless, necessary improvements, etc.
- Participants are aware of the continuation of the initiated process within DESIRE

Annex

Report format



Workshop Report - English summary

Stakeholder workshop 1

Land degradation and desertification – existing and potential prevention and conservation strategies

Results and conclusions from the stakeholder workshop

Name of the study site:

Date of workshop:

Author(s):

I General information

A) Workshop

Workshop venue:

Workshop moderator(s):

List of workshop participants:

First name, name	Stakeholder category / institution (e.g. land user, researcher, NGO, GO)	Local or external participant? (L / E)

B) Background

Please provide background information on the context in which the workshop was conducted (area covered, no. of inhabitants, predominant types of land use, main types of land degradation, constraining factors for soil and water conservation, etc.)

II Results and conclusions from sequences / exercises

*Please provide the following information - **results and conclusions from the exercises** - and illustrate where possible with photos from the workshop*

1) Impact chains – chains that link causes and effects of land degradation

(→ results from Exercise 2: the water and biomass cycles)

- A. Disturbances identified in the water and biomass cycles
- B. Causes and effects of land degradation (→ impact chains)
- C. Socio-cultural, economic, political, and legal constraints
- D. Already applied solutions at the local level

2) List of local indicators for land degradation and conservation

(→ results form Exercise 3)

Indicator	Used by (stakeholder group)

3) List of stakeholders and their influence and interest in regard to sustainable land management

(→ results form Exercise 4)

Stakeholder / stakeholder group	<u>Influence</u> on the sustainability of land use?	<u>Motivation</u> to implement sustainable land management?	Comments

4) Selection and appreciation of locally applied technologies and approaches (→ results from Ex. 7)

Please fill in the following table for different stakeholders:

4.1. Assessment made by **local stakeholders**:

Technology / approach	Already applied or potential solution?	On land use type (e.g. crop land / grazing land, etc.)	Labour required (initial and maintenance)	Costs (initial and maintenance)	Impact / Effectiveness						Limiting factors / constraints	Overall assessment of the potential for the local context
					economic		ecological		socio-cult.			
					ST	LT	ST	LT	ST	LT		

Legend:

ST = short-term LT = long-term

Labour and costs: very low, low, medium, high, very high

Impact / effectiveness: +++ (very positive), ++ (positive), + (slightly positive), 0 (medium),

- (slightly negative), -- (negative), --- (very negative)

4.2. Assessment made by **external stakeholders**:

Technology / approach	Already applied or potential solution?	On land use type (e.g. crop land / grazing land, etc.)	Labour required (initial and maintenance)	Costs (initial and maintenance)	Impact / Effectiveness						Limiting factors / constraints	Overall assessment of the potential for the local context
					economic		ecological		socio-cult.			
					ST	LT	ST	LT	ST	LT		

Legend:

ST = short-term LT = long-term

Labour and costs: very low, low, medium, high, very high

Impact / effectiveness: +++ (very positive), ++ (positive), + (slightly positive), 0 (medium),

- (slightly negative), -- (negative), --- (very negative)

4.3 List of technologies / approaches to be evaluated by WOCAT methodology (result from Ex. 7)

Please list those technologies / approaches that will be documented and evaluated (after the workshop) with the WOCAT questionnaires

4.4 Draft outline of a strategy for sustainable land management (Ex. 8)

III Evaluation of the workshop (Ex. 9)

Evaluation of contents and methodology of the workshop:

- By participants (local and external)
- By the moderator(s)

IV Other information

Difficulties encountered:

Changes made concerning the procedure suggested in the workshop guidelines:

How was the interest and participation of the different stakeholder groups in the workshop?

Recommendations:

Comments: